Relationship of Emotional Intelligence and Adherence to Combination Antiretroviral Medications by Individuals Living with HIV disease

A Thesis
Submitted to the Faculty
of
Drexel University
by
Suzanne Willard
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
May 2003
ACKNOWLEDGEMENTS

It is not without love and support of family, friends and colleagues that I would not have been able to complete this. Jim McDowelle, my chair, for his persistance, support, candor and sense of humor. Gloria Donnelly and Mary Lou McHugh for their guidance and wisdom in the field of nursing. To my committee, for their thoughtful review of this manuscript. For Linda Samost for her expertise in statistical analysis.
TABLE OF CONTENTS

LIST OF TABLES ........................................................................................................ v

ABSTRACT ................................................................................................................ vi

1. INTRODUCTION/BACKGROUND ........................................................................ 1

2. REVIEW OF LITERATURE ..................................................................................... 4

   2.1 HIV Disease ...................................................................................................... 7

       2.1.1 Epidemiology, pathophysiology and treatment ........................................ 7

       2.1.2 Treatment and adherence ........................................................................ 11

   2.2 Emotions and HIV .......................................................................................... 14

   2.3 EI as a theoretical framework ........................................................................ 17

       2.3.1 History of the study of emotions ................................................................. 17

   2.4 Emotional intelligence and adherence ............................................................ 21

3. METHOD .................................................................................................................. 24

   3.1 Significance ....................................................................................................... 24

   3.2 Variables ........................................................................................................... 24

   3.3 Sample ............................................................................................................... 24

   3.4 Data collection plan ......................................................................................... 26

   3.5 Instruments ....................................................................................................... 26

   3.6 Reliability of tools ........................................................................................... 27

   3.7 Safety and confidentiality .................................................................................. 28

   3.8 Data analysis ..................................................................................................... 29

4. RESULTS .................................................................................................................. 30
LIST OF TABLES

2.1. Clinical and laboratory standards for AIDS diagnosis .........................5
2.2. Definition of terms ...........................................................................8
2.3. Overview of the four branch model of emotional intelligence ..........19
4.1 Demographic data .............................................................................31
4.2 Correlations between MSCEIT branch scores and adherence ...........33
4.3 EQ scores ......................................................................................34
4.4 Total score ....................................................................................35
4.5 Total score statistics (without outliers) .............................................35
4.6 Gender distribution ........................................................................36
ABSTRACT
Relationship of Emotional Intelligence and Adherence to Combination Antiretroviral Medications by Individuals Living with HIV disease
Suzanne Willard
James O. McDowelle, EdD

Medication usage is an intentional and purposeful means to the successful management of many chronic diseases. In the treatment of the disease caused by Human Immunodeficiency Syndrome (HIV), adherence to medication is of particular concern in that any level of non-adherence, often a few missed doses, will lead eventually to the development of drug resistance. Many predictors of poor adherence to HIV medications have been identified to be a significant factor in adherence. Among those predictors that have been found to be factor include the emotional aspect affecting adherence.

The purpose of this study was to determine the relationship between emotional intelligence as measured by the Mayer, Salovey, Caruso Emotional Intelligence Test (MSCEIT) and adherence to Combination Anti-retroviral Therapy in individuals who are infected with the Human Immunodeficiency Virus (HIV). Emotional intelligence (EQ), is defined as the ability to (a) perceive and express emotions, (b) facilitate emotions, (c) understand and reason with emotion and (d) manage emotions. It has been correlated with various aspects of success in life. Adherence was measured by self-report and defined as less than 10% missed doses of medications. Participants were recruited from an urban hospital-based HIV clinic.

Eighty-two subjects were recruited with 52 completed data sets for analysis. Pearson’s r was used to analyze the data for significance and no correlation was found. This data set was not enough to prove significance, statistically, of the research question.
However, an unexpected finding of this study revealed that the overall EQ scores for this particular study population were markedly lower than the test norms. Further study would be warranted and recommended to explore the utilization of EQ in people at risk for HIV disease or those individuals who have the disease to further understand the impact that emotions and EQ have on this specific population.
CHAPTER 1. INTRODUCTION/BACKGROUND

The disease that is known as Acquired Immuno-Deficiency Syndrome (AIDS) was first identified as an epidemic in 1981 (CDC, June 5, 1981). Currently, there are over 750,000 individuals with AIDS identified in the United States (CDC, 2000) and over 40 million infected in the world (UNAIDS, 2001). The Global AIDS Policy Coalition (Mann & Tarantola, 1996) described lessons learned about the epidemic as: (a) No community or country already affected by AIDS has been able to stop the spread of the Human Immunodeficiency Virus (HIV); (b) HIV is spreading rapidly to new communities and countries around the world, and HIV will reach most, if not all, human communities; (c) The global epidemic becomes more complex as it matures and is composed of thousands of smaller, complicated sub epidemics as HIV exploits every potential avenue in society; and (d) HIV has demonstrated repeatedly its ability to cross all borders – social, economic, cultural, political and geographic – and the conditions that foster HIV spread are complex and changing.

When an individual is diagnosed HIV positive, he or she experiences many profound emotions. This illness, as stated by Sontag (1989), “flushes out an identity that might have remained hidden from neighbors, job, mates, family, and friends.” (p. 25). In 2002, HIV is a chronic, complex, disease. However, since 1995, there has been a dramatic growth in pharmacological treatment of HIV/AIDS and has resulted in a dramatic decline in the death rate due to the disease(Bartlett & Gallant, 2001; Ungvarski & Flaskerud, 1999). Treatment regimes often require multiple medications scattered
throughout the day. The virus, however, has shown an ability to mutate at a rapid pace if the medications are not taken in the exact prescribed manner. Often, in such cases, the virus grows resistant to the prescribed medications that are designed to help. Medications will then lose their ability to adequately control this virus. Leading more to the importance of adherence to the control of this disease.

The literature review demonstrated that there are patterns of adherence addressing why some individuals take medicines and others do not. Chesney (2000) in her review of adherence and HIV medications has reported that the relationship with the health care provider, simply forgetting, being too busy, being out of town, being asleep, being depressed, the medications having adverse side effects, and being too ill to take the medications were related to adherence. Adherence is not the only aspect of this disease that has demanded innovative and creative measures to improve health outcomes.

HIV has challenged health care systems. Clinical systems have been designed to respond to the multiple demands that this disease has had upon society. Programs in the United States have been funded that provide social support in addition to clinical services most notably thru the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act. In 1990, the CARE Act was signed into law with the purpose to improve the quality and availability of care for people with HIV/AIDS and their families. Amended and reauthorized in May 1996, the Act is named after an Indiana teenager, Ryan White, who became an active public educator on HIV/AIDS. He died of AIDS the same year the legislation was passed (U.S. Department of Health and Human Services, 2002).

As health care systems have been pushed by this disease to be creative, methods to improve adherence to medications also requires creative approaches to improve
patient’s lives. Programs have been designed to improve these patterns of adherence. One recent study has shown that attending to an individual’s emotional responses would improve the ability to adhere to regimes (Pradier et al., 2002). As an individual provider this has proven to be frustrating in seeking some method to help patients adhere to medications.

Emotional intelligence (EI) is an emerging body of knowledge that has promise in exploring issues of adherence. Emotional intelligence can be defined as:

“…an ability to recognize the meanings of emotions and their relationships, and to reason and problem-solve on the basis of them. Emotional intelligence is involved in the capacity to perceive emotions, assimilate emotion-related feelings, understand the information of those emotions, and manage them (Mayer, Caruso, & Salovey, 1997, p.267).

The literature review will demonstrate that EI is an area that has value in further understanding why some individuals are able to successfully adhere to medications and why others cannot. Pradier (personal communication, February 26, 2002) stated that it would have been important to have a tool to identify different aspects of emotions to better address the needs of the subjects in his study. Assessment of emotional intelligence may provide such a tool.

Simply put, health care providers need to understand why individuals take or fail to take their medications. Applying the emotional intelligence model to the concept of medication adherence may provide more understanding of how providers can help their patients take their medications in order to improve their quality of life as well as extend their lives.
CHAPTER 2. REVIEW OF LITERATURE

HIV causes a serious chronic disease that requires a complex treatment regime. HIV invades the immune system of the human body. Infection occurs through contact with blood and body fluids, most often through sexual contact. The virus can also be passed from an infected woman who is pregnant to her children during pregnancy, delivery or through breast-feeding (UNAIDS, 2001). HIV destroys a specific white blood cell, the CD4 cell. HIV will cause a constellation of symptoms that include infections to common pathogens that will cause no symptoms in a healthy individual. These common pathogens are ubiquitous, meaning that they are present in most humans. In most humans, the immune system does not allow the pathogens to cause disease. Disease-specific symptoms result in what is commonly identified as Acquired Immuno-Deficiency Syndrome (AIDS). A health care provider using certain clinical or laboratory standards makes the diagnosis of HIV/AIDS. Table 2.1. is a listing of the opportunistic infections that causes a diagnosis of AIDS. Under-treated or untreated HIV disease will always cause the individual patient to be faced with an AIDS defining illness.
Table 2.1. Clinical and Laboratory Standards for AIDS Diagnosis

Candidiasis of esophagus, trachea, bronchi, or lungs

Coccidiomycosis, extrapulmonary
Cryptococcosis, extrapulmonary
Cryptosporidiosis with diarrhea > 1 month
CMV of any organ other than liver, spleen or lymph nodes
Herpes simplex with ulcer > 1 month or bronchitis, pneumonitis, esophagitis
Histoplasmosis, extrapulmonary
HIV-associated dementia, interfering with occupation or activities of daily living
HIV-associated wasting: Involuntary weight loss >10% of baseline
Isoporosis with diarrhea > 1 month
Kaposi’s sarcoma in patient under 60 years
Lymphoma, Burkitts, immunoblastic, primary CNS
Mycobacterium avium, disseminated
Mycobacterium tuberculosis, pulmonary, extrapulmonary
Pneumocystis carinii pneumonia
Pneumonia, recurrent-bacterial (>2 episodes in 12 months)
Progressive multifocal leukoencephalopathy
Salmonella septicemia, recurrent
Toxoplasmosis of internal organ
Wasting syndrome due to HIV
CD4 less than 200/mm

(Bartlett & Gallant, 2001)
Pharmacological treatment of AIDS has dramatically improved since 1995 with the introduction of the protease inhibitor (Bartlett & Gallant, 2001; Ungvarski & Flaskerud, 1999). Treatment regimes require multiple medications scattered throughout the day and treatment is often recommended when there are few evident symptoms or manifestations of the disease (U.S. Department of Health and Human Services, 2001). Good response to any medication occurs when there is enough of the medication in the bloodstream for the medication to be effective. Therefore, when the level of the drug is not in the system long enough or the dosage is not correct or if a dosage has been missed, the level of circulating medication in the body decreases. When this occurs, the target for the drug, either a bacteria or a virus, will be able to continue to grow. Medications that are used against any infection usually target a piece of the bacteria or virus that is essential to its reproduction. Because of the tenacity of the HIV virus and the need to target multiple parts of the virus with many medications, pharmacological treatment of HIV is commonly referred to as “Highly Active Antiretroviral Therapy” or HAART. However, issues of adherence and emerging viral resistance occurs even with perfect adherence, HAART may be a misnomer. Therefore, for the purpose of this paper, antiretroviral treatment will be referred to as CART (combination antiretroviral therapy).

CART requires the solution of many complex issues to be successful. In fact adherence to medications frequently have posed a challenge for both patient and provider. Medications have been used throughout time to treat illness. (Katzung, 1998). A drug that is used for therapeutic purposes brings about a change in biologic function through its chemical actions. In viruses, such as HIV, drugs act on specific proteins that are necessary for the virus to replicate and inhibit them in their ability to reproduce. The
HIV virus is a parasite; its’ life depends upon the host. Drugs used against viruses must block entry into the host cell or be active inside the host cell (Safrin & Chambers, 1998). Research on drugs that have been designed to work on HIV have demonstrated that there needs to be several different types of anti-virals to effectively control viral replication (Bartlett & Gallant, 2001; Safrin & Chambers, 1998).

2.1 HIV disease

2.1.1 Epidemiology, pathophysiology and treatment.

The AIDS epidemic has challenged health care systems on several levels. First, in the way care is delivered and second, in the way that treatments have been identified and utilized. Treatments have come to general use quicker than other drugs because of the urgency of the disease and the impact of activists (Julie Davids, ActUP, personal communication, April 22, 2001). The advances in the knowledge of managing AIDS have been rapid. However, biological and social scientists are still working diligently to seek an understanding of the complexities of this disease. Much has been learned, but twenty years into the epidemic, treatment and management are still considered to be in its infancy (Harrington & Carpenter, 2000; Miramontes, 1999; Ungvarski & Flasketud, 1999).

Table 2.2 is a definition of terms that are frequently associated with HIV/AIDS.
## Table 2.2 Definitions of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4/T-Cell</td>
<td>A type of white blood cell that is considered a surrogate marker to determine HIV-related immune dysfunction</td>
</tr>
<tr>
<td>Viral load</td>
<td>Measurement of the amount of virus circulating in the blood stream at the point that the test is taken.</td>
</tr>
<tr>
<td>Viral Resistance</td>
<td>Viral mutation in its replication process to a point at which the medications will not work</td>
</tr>
<tr>
<td>AIDS</td>
<td>Disease caused by HIV with severe immune suppression and opportunistic infections.</td>
</tr>
</tbody>
</table>

(Bartlett & Gallant, 2001)

HIV is a retrovirus that enters and infects others through contact with bodily fluids. The most common route of contact is sexual. A retrovirus is a type of virus that has the ability to reverse the usual flow of genetic information for the purpose of reproduction. Transmission occurs through various routes where an individual is exposed to fluids such as human blood, vaginal secretions, semen and breast milk. (Bartlett & Gallant, 2001; Ungvarski & Flaskerud, 1999). The life cycle of the virus is as follows: (a) the virus attaches itself to the CD4, (b) it inserts itself into the cell and begins to reproduce, (c) it integrates newly synthesized DNA into the host cell DNA, and transcribes and translates the viral genetic message into viral protein, (d) then releases the
virus out of the host cell to go and infect other host cells (Bartlett & Gallant, 2001; Ungvarksi & Flaskerud, 1999).

As many as 10 billion new HIV virions are produced daily in an HIV-infected person (Feinberg, 1996). However, disease progression has a variable course. Often there is a long period of time without physical symptoms that requires treatment before the advent of an AIDS defining illness. It can take up to an average of 10 years before the opportunistic infections that signal an AIDS diagnosis occurs (Bartlett & Gallant, 2001). Infection with HIV has a highly individualized course. There are some in whom the disease progresses rapidly, causing symptoms in as little as a few years after infection. While some individuals rapidly progress, others do not and are classified as long-term non-progressors (Ungvarski & Flaskerud, 1999). Many factors explain the rate of disease progression. Among these are the amount of circulating virus and its virulence, and how the host’s immune system fights the virus’s replication. There are other factors that may impact the host’s immune system in either a positive or negative manner: e.g. stress (Bartlett & Gallant, 2001; Ungvarski & Flasketud, 1999).

The primary or acute HIV infection phase is the period of time following initial entry of HIV into a person’s body. Acute infection sees the virus replicating in staggering numbers in the blood. The initial immediate immune response symptoms are often overlooked and diagnosis does not readily occur. Early symptoms include lymphadenopathy (swollen glands), fevers, and fatigue. The symptoms of initial infection have a median duration of 14 days. Once the immune system mounts an initial response to this new pathogen, the system causes the virus to slow its replication process, slowly destroying the CD4 cell. CD4 cells at the 200 level will demonstrate signs of
immune suppression. The most commonly seen early symptoms include thrush (a fungal infection in the mouth), weight loss and peripheral neuropathy (numbness and tingling in the hands and feet) (Bartlett & Gallant, 2001; Daar, 1998; Ungvarski & Flackerud, 1999).

The immune system is a marvelous and complex entity that has the ability to recognize foreign intruders and mount a defense. The immune system produces cells that surround the intruder and either compartmentalizes it, rendering it helpless or completely removes and destroys the microbe. An example of a microbe that is rendered helpless is the microbe that causes pneumocystis carinii pneumonia (PCP). Once the immune system is greatly impacted and no longer has the capability of confining this microbe, it resurfaces and causes symptoms, usually a severe pneumonia, which can easily lead to death (Bartlett & Gallant, 2001). The virus attacks a key part of the immune system – the CD4 cell. The virus uses these cells as a factory in which it can replicate and cause cell destruction. This will lead to the ultimate destruction of the immune system and cause a phenomenon known as immunosuppression (Fauci, Panatleo, Stanley, & Weissman, 1996). This period of time in which the cells are being destroyed is called one of quiescence and there are no obvious physical symptoms. Disease progression can be monitored thru laboratory tests to count the number of CD4 cells. In a healthy human this number is 500 to 1500 cells per cubic millimeter of blood (Bartlett & Gallant, 2001; Ungvarski & Flackerud, 1999). Opportunistic infections become evident when an individual’s CD4 cells are 200. (Bartlett & Gallant, 2001)

As earlier noted, disease progression occurs at a variable rate. From time of infection, people with HIV often do not show any AIDS-defining illnesses for 6 – 10 years (Pantaleo, Grazioai, & Fauci, 1993). Several variables have been related to disease
progression. Biological variables include amount of circulating virus, age of host and reinfection with more virus, usually thru sexual interactions with other individuals with HIV (Bartlett & Gallant, 2001). Disease progression will also occur when an individual is not able to adhere to pharmacological treatments (Paterson, et al. 2000). Viral resistance is a phenomenon that occurs when the virus, which is replicating at a rapid pace, experiences genetic mutations thru the process of replication (Deeks, 2000). Resistance rapidly occurs when there are inadequate blood levels of drug therapy circulating, therefore allowing the virus to replicate in the presence of the medications. The most common cause of resistance is the inability to adhere to the often-complex regimes (Chesney, Morin, & Sherr, 2000). Many regimes require frequent pill doses throughout the day. The medications require precise adherence to a complex daily regimen involving up to 18 pills that often have unpleasant side effects. It is obvious that adherence is a challenge for all affected.

2.1.2 Treatment and adherence

Treatment for many people living with HIV, many of whom are without physical disease symptoms includes Combination Antiretroviral Therapy (CART) for the rest of their lives (Bartlett & Gallant, 2001; U.S. Department of Health and Human Services, 2001). The ability of the patient to adhere to the regimen is essential for successful treatment. The terms adherence and compliance are often used interchangeably in the literature. Compliance is a synonym for obedience and is a value-laden term. The Hippocrates statement in Turner’s and Hecht’s editorial “The physician must….make the patient…cooperate“ (2001 p. 1004) is filled with paternalism that might affront
modern patients as well as their health care providers; however, this term is still in use. For the purpose of this study, the term, adherence, will be utilized. Adherence is defined as the ability to take medications as prescribed.

Effective treatment of HIV disease has been used since the introduction of the protease inhibitor in 1996 (Deeks, 2000). Literature on adherence research in HIV disease is limited in comparison with other diseases because treatment is still in its infancy. The advent of efficacious treatment in 1996 with combination therapy and the challenges that this presented gave rise to this area of research. What is known is that excellent adherence has been shown to increase the likelihood of sustained control of the virus, which is important for reducing HIV-related morbidity and mortality. Poor adherence has been shown to increase the likelihood of medication failure and has been associated with increased morbidity and mortality. Also, poor adherence leads to the development of drug resistance, therefore, limiting the effectiveness of therapy (Chesney, 2000; Deeks, 2000; Harrington & Carpenter, 2000).

A high degree of adherence is necessary for optimal virologic suppression with CART; several studies as reviewed by Paterson, et al. (2000) have shown that 90-95% of doses must be taken for optimal suppression, and lesser degrees of adherence are more often associated with virologic failure. There is no conclusive evidence that the degree of adherence required varies with different classes of agents or different specific medications in the CART regimen (Paterson, et al. 2000).

Imperfect adherence is common. Stephenson, Rowe, Haynes, Macharia, & Leon (1993), in a review of all medication adherence, noted that there is an approximately 50% compliance rate with long-term self-administered therapy in any chronic disease. In
studies of adherence to HIV treatment, surveys have shown that one-third of patients missed doses within 3 days of when the question concerning adherence was asked (Ickovics & Meisler, 1997). The reasons for missed doses were predictable and included forgetting, being too busy, being out of town, being asleep, being depressed, having adverse side effects, and being too ill (Chesney, 2000). One fifth of HIV infected patients in one urban center never filled their prescriptions. Many people infected have no home, nor do they have access to adequate medication storage. This may lead to poor adherence, but not without exception; one recent program achieved a 70% adherence rate among the homeless utilizing flexible clinic hours, accessible clinical staff, and incentives (Bangsberg, 1997).

Many predictors of poor adherence to HIV medications have been identified. These include (a) poor clinician-patient relationship, (b) active drug and alcohol use, (c) active mental illness, particularly depression, (d) lack of patient education, (e) inability of patients to identify their medications, and (f) lack of reliable access to primary medical care or medication (Chesney, 2000; Shapiro, et, al; 1999; Stone et al., 1998; Tedaldi, Willard, Gilmore, Holdsworth, & Axelrod, 2002). Other sources of instability that may influence adherence include domestic violence and discrimination (Shapiro, M. et, al; 1999). Medication side effects also may cause poor adherence (Max & Sherer, 2000). Factors such as gender, race, socio-economic status, educational level, and a past history of drug use do not reliably predict poor adherence. Conversely, a higher socioeconomic status and educational levels and a lack of a history of drug abuse do not predict adequate adherence (Sherer, 1998).
Predictors of good adherence to HIV medications have also been identified. These include: (a) availability of emotional and practical life supports, (b) the ability of patients to fit the medications into their daily routine, (c) the understanding that poor adherence leads to resistance, (d) the recognition that taking all medication doses is important; and (e) feeling comfortable taking medications in front of people (Cheever, 1999). It is evident that many factors relating to adherence and non-adherence have strong emotional overtones, e.g. a history of depression, relationships with the health care provider and the stigma of this disease. Pradier and colleagues’ (2002) intervention has shown that when the emotional aspects of HIV and adherence were addressed, there was a significant improvement in adherence and improved viral control.

There is a lack of agreement on the best method to assess adherence. Many studies have used drug levels, pill-counting devices and counting procedures (Arnsten et al., 2001; Liu et al., 2001; Stephenson et al., 1993). Research in this area continues as a good measure of adherence has yet to be agreed upon.

It is important for health care providers to gain understanding of why individuals take their medications. Because of the many factors related to adherence associated with adherence, the emotional intelligence model may provide further insight into medication adherence and may provide more understanding to helping patients take their medications.

2.2 Emotions and HIV

There is evidence (Robinson, 2000) that stress may play a role in HIV disease progression by increasing viral replication and suppressing immune response. Ungvarski
(2000) states, “active coping is believed to have beneficial health effects” (p. 35) as it relates to HIV/AIDS as well as all disease states. Active coping includes (a) problem solving activity, (b) increased expression of emotions, (c) altering one’s lifestyle, and (d) taking control of the management of one’s health and well-being. He further draws attention to the benefit of emotional expression. Finding positive pathways to emotional expression thru groups, professional and social, family, friends is beneficial as demonstrated by Cole, Kemeny, & Taylor (1997). Cole and colleagues also reported that expression of basic emotions was related to increased immune function as measured by the CD4 cell count.

Being diagnosed with HIV infection has a large emotional aspect (Stevens & Doerr, 1997). Individuals often feel that they have been punished for past digressions of societal mores. This sense of punishment and society’s viewpoint of homosexuality and drug abuse perpetuate the high level of stigma associated with the disease. As this is predominately a sexually transmitted disease, it is a disease of individuals who have sex (Ungvarski & Flaskerud, 1999). Stevens (1997) found that for women with HIV, just being informed of the diagnosis of HIV was a traumatic event, carrying with it elements that are common to other types of trauma, especially, perceived threat to one’s life and perceived responsibility for the deaths of others. Reactions of shock, fear, and anguish are common when an individual first learns of their infection. The response of society to the information is devastating as well. There is a lack of research on the connection between the emotions of the disease and the subsequent ability to manage the disease.

The secrecy of the diagnosis of HIV is omnipresent, adding to the stress of living day to day with HIV. Laws have further reinforced this secrecy in that many health
departments are unable to report the number of individuals infected with HIV disease as they do with other communicable disease (Leibowitz, Kessler, & Frumkin, 1999). Adherence to complicated medication regimes, negotiating safe sexual practices, and health promotion and wellness activities are easily compromised by the complexities of the lives of HIV positive individuals. For example, one patient stated: “Don’t write the name AZT (a commonly used drug) on the pill bottle, I don’t want anyone to know in my house” (Anonymous, personal communication, September 25, 2001).

As mentioned previously, the reactions of an individual to being informed that they are HIV positive are filled with emotions. The women in Stevens & Doerr’s study (1997) stated that the

“trauma of HIV discovery was an epiphany; a confirmation or calamity and the impact often took its toll in misery, escalated drug use, suicidal feelings and destabilization of relationships… ‘He (the doctor) told me I was infected with the HIV virus. I thought he had sentenced me to die’” (p.4). Another woman in the same study said, “I thought I was going to drop dead at any moment. I lived like that for a couple of years” (p.4). One third of these women reported that they wanted to be dead. Another stated: “I didn’t feel good after they told me. I tried everything I could to off (kill) myself, to leave here. But, I always woke up. I am still here. I should have left. Sometimes I feel like that right now” (p. 11).

What can be thought of as short-term subjective experiences of emotional trauma – confusion, panic, inconsolable grief – will continue into a prolonged period of distress
(Van der Kolk, McFarlane, & Weisaeth, 1996). One could wonder what is the impact on
the management of this disease when the negative feelings are so strong.

Grassi et al (1999) reported that patients’ emotional adjustment to HIV infection
is a complex phenomenon involving a number of variables including individual as well as
psychosocial factors. Their study compared three groups: individuals with HIV, those
with other serious diseases, and those with cancer. They found that patients with HIV
disease had a higher emotional burden when compared with the other two groups.
Pakenham and colleagues (1996) reported in their research study that distressing
emotions was the most frequently reported problem. Sadness was a common emotion.
They also reported that both the participants without symptoms as well as the
symptomatic participants reported a full gamut of emotions and that the groups differed
little with respect to frequency and type of emotion reported.

The full impact of emotions and their effect on managing this disease is poorly
understood. Pradier et al (2002) found that adding a counseling component to the
educational adherence program that included addressing emotions resulted in a positive
outcome, a significant reduction of HIV viral load.

2.3 EI as a theoretical framework

2.3.1 History of the study of emotions

Humans have been long been intrigued with the concept of the impact of emotion
on human existence. The ancient Greeks noted, “that mentation, rationality, foresight
and decision making can be hijacked by the pirates of emotion” (Cacioppo, 1999, p.
194). Plato and Aristotle wrote about the internal conflicts among thoughts, desires and
emotions (Lazarus, 1999). Lazarus defined the emotions as a “a complex organized system consisting of thoughts, beliefs, motives, meanings, subjective bodily experiences, and physiological states, all of which arise from our struggles to survive and flourish by understanding the world in which we live” (p. 100). There has been discussion throughout the ages on how to diminish the influence of emotion on decision-making and behaviors (Cacioppo & Gardner, 1999; Lazarus, 1999).

The work of Dr. Peter Salovey and Dr. John Mayer in the early 1980’s first described the concept that is now known as Emotional Intelligence (EI). Dr. Peter Salovey is currently at Yale University and Dr. John Mayer is currently at the University of New Hampshire. Their work is based upon a long history of the study of intelligence and its correlation with abstract thinking (Mayer, 2001b, 2000).

EI, while studied and written about in academic literature, was relatively unknown to the general public until the mid-1990’s. The concept was brought to the public’s attention in a popular book *Emotional Intelligence* (Goleman, 1995a). EI was further propelled into the popular culture thru the press, via Time magazine (Gibbs, 1995) and Goleman’s (1995a, 1995b) related work. These articles reviewed the importance of EI as it pertained to success in school and in the workplace and stated that it was an overlooked part of personality. Goleman (1995a) also proposed that EI could be easily learned or acquired and therefore improved.

As an ability, EI has been explored and further defined by Mayer, Salovey and Caruso (2000). They described EI as an ability that arises from a union of the cognitive and emotional system. Mayer, Salovey and Caruso (2000) conceptualize EI into a four-
branch model: (1) perceiving emotions, (2) facilitating thought, (3) understanding emotions and (4) managing emotions. See Table 2.3.

<table>
<thead>
<tr>
<th>Branch name</th>
<th>Brief description of skills involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceiving Emotions (Branch 1)</td>
<td>The ability to perceive emotions in oneself and others, as well as in objects, art, stories, music and other stimuli.</td>
</tr>
<tr>
<td>Facilitating Thought (Branch 2)</td>
<td>The ability to generate, use, and feel emotion as necessary to communicate feelings, or employ them in other cognitive processes</td>
</tr>
<tr>
<td>Understanding Emotions (Branch 3)</td>
<td>The ability to understand emotional information, how emotions combine and progress through relationship transitions, and to appreciate such emotional meanings.</td>
</tr>
<tr>
<td>Managing Emotions (Branch 4)</td>
<td>The ability to be open to feelings, and to modulate them in oneself and others so as to promote personal understanding and growth.</td>
</tr>
</tbody>
</table>

(Mayer, Salovey, & Caruso, 2002, p.7)

The cognitive system carries out abstract reasoning about emotions, while the emotional system enhances cognitive capacity (Mayer, 2000, 2001a; Mayer, Salovey, Caruso, & Sitarenios, 2001). In other words, emotional intelligence is the ”ability to regulate emotion in a way that enhances living”(Gibbs, 1995, p. 45).

Mayer and Salovey (2000) view EI as operating across both cognitive and emotional systems. They also believe that one can use emotions to improve thinking or cognitive processes.

The mind-body connection of EI is important for the purpose of this study. The core of emotions is centered in the limbic system and the amygdala deep within the brain. The limbic system is composed of several brain structures that have been associated with emotions as well as with memory. The amygdala is an almond sized structure in the
midbrain (LeDoux, 2000; Pert, 1997). It is within these areas that the catecholamines, adrenaline and nor adrenaline, are regulated. These chemicals mobilize the body for an emergency and provide memories of these events (Golman, 1995). That is, when an individual has been exposed to trauma, physical or emotional, this system becomes hyper-reactive secreting large doses of these chemicals in response to situations that hold little or no threat but somehow are reminders of the original trauma. Changes in these systems are thought to underlie trauma symptoms and include anxiety, fear, being easily upset and aroused, readiness for fight or flight and the indelible encoding of intense emotional memories (Goleman, 1995; Pert, 1997). A defining characteristic of a traumatic event is the ability to provoke fear, helplessness or horror. People with Post-Traumatic Stress Disorder (PTSD) have distinct types of symptoms that include re-experiencing the event and avoidance of reminders of the event (Yehuda, 2002). While there are no conclusions that state that learning a diagnosis of HIV is the same as an event that may trigger PTSD, the similarities, of the emotional responses (i.e., avoidance of reminders of the event) cannot be denied.

Studies also have shown that there are high incidences of people who are HIV positive who also have a history of abuse (Cohen et al., 2000; Gregonis & Grant, 1994; Jinich, S., et al 1996). Heim and colleagues (2000) have shown that women with a history of childhood abuse exhibited increased pituitary-adrenal and autonomic responses to stress compared with controls. This is likely related to an increased risk for adulthood psychopathological conditions. These are the same pathways that LeDoux (2000) spoke about in his work on emotions. Several studies have illustrated strong sympathetic nervous system reactivity to the expression of basic emotions (fear, anger, surprise,
disgust, happiness and sadness) that are related to increased immune function and enhanced mental and physical health (Cole, Kemeny & Taylor, 1997; Gross 1989). These studies cited interactions among emotional expression, strong autonomic reactivity and increased immune response. Some studies (Cole, Kemeny & Taylor, 1997; Miller, & Cole 1998) have demonstrated that emotional stressors – secrecy, social identity and social relationships can have a deleterious effect on physical and mental health. Trinidad and Johnson (2002) concluded that adolescents with high EI might possess a greater ability to avoid tobacco and alcohol use that would have a deleterious effect on their health.

2.4 Emotional intelligence and adherence

While there have been studies, as noted previously, on the emotions of living with HIV, and a correlation of EI and health behaviors, little research has been conducted on the correlation of emotional intelligence and the HIV positive individual’s ability to adhere to their medication regime. Communication with EI researchers and authors, Dr. Peter Salovey of Yale University (personal electronic communication July 5, 2001) and Dr. David Caruso (personal communication, February 8, 2002) further confirmed the importance of this research question. Salovey wrote, “most traditional variables that…have studied have not been good predictors of adherence. Why not try EI?” The literature on adherence to ART medication regimes has not identified ideal measures to improve adherence. Therefore innovative approaches to study this phenomenon needs to be explored.
The application of EI to success in disease management was explored by Samar (2001). The diabetics in this study demonstrated a correlation between EI and disease self-management skills. Samar (2001) concluded that there is a relationship between disease management practices in diabetics and EI as measured as an ability using the Multifactor Emotional Intelligence survey (MEIS). Diabetes is a chronic illness that requires daily medications to control symptoms as well as the disease itself. Untreated or poorly managed diabetes, like HIV, can have catastrophic results. Samar used Mayer and Salovey’s MEIS as a test to see the relationship between EI and disease management. The MEIS is an earlier version of Mayer and Salovey’s measure of emotional intelligence (EQ). As diseases, there are similarities between the management and treatment of these two chronic illnesses, diabetes and HIV. Samar’s research provides a model study similar to the study proposed in this paper. She recommended that clinicians become more aware of the multidimensional nature of self-management of disease and to avoid the negative connotations of common words used in clinical care, such as - non-adherence and non-compliance. In Samar’s study (2001), a significant relationship was found between self-management and one branch of the measure of emotional intelligence the MEIS (r=.335, p=.001) (p.69). Samar’s (2000) research concluded that while there was a correlation of EI and disease management (Pearsons r=.21, significance p=.048) (Samar, 2000, p 69), emotional intelligence provided an effective framework to link self-management practices by measurable abilities. Salovey (2001a) also has given thought to the connection between EI and disease responses. He wrote “EI appears to be central in maintaining good health” (p. 184).
This study proposed to look at adherence from an emotional perspective that has not been extensively studied. If there is a positive relationship between EI and adherence, then educational efforts could be designed to improve EI with the expected outcome to improve adherence.
CHAPTER 3. METHOD

This study investigated the relationship between EI and medication adherence in a population of HIV positive individuals. The questions for study were: what is an individual’s emotional intelligence score and, is there a relationship between that score and the ability to adhere to medication regimes as measured by self-report?

3.1 Significance

The significance for the study was two fold: (a) that the EI scores of HIV positive individuals may bring to light another aspect of living with this potentially devastating chronic illness that was previously fully understood. And (b) health care providers may have been able to modify their practice and patient education methods to increase an individual’s potential to improve adherence, given information related to EI.

3.2 Variables

The independent variable for study was emotional intelligence as measured by an ability scale; the Mayer, Salovey, Caruso Emotional Intelligence Test (MSCEIT). The dependent variable was self-report of adherence to medication.

3.3 Sample

A sample was drawn from patients who present for an appointment at the Partnership Comprehensive Care Practice in the Division of HIV/AIDS at Drexel University, formerly known as MCP/Hahnemann University. This is a health care practice that provides both primary as well as specialty care for individuals with for HIV
disease. The clinic is situated centrally within the city of Philadelphia, a large metropolitan area in the northeastern part of the United States. Over 1200 individuals receive their medical care at this facility, in the course of a year. Sixty percent are men and 40 percent are women; the population is predominantly African American and Latino (90%). The demographic profile of this population mirrors the epidemiology of HIV disease on a national level. Services that are provided include primary medical care as well as specialty care. Case management services, nutritional counseling, pharmacological counseling and mental health services are also available. There is a team of seven health care providers, 4 physicians and 3 nurse practitioners. Approximately 50 patients are scheduled for providers each day. The clinic is open five days a week and services are also available on a walk-in basis. The clinic also has a large research component of industry sponsored clinical trials and the clinic population is accustomed to participation in research studies. The researcher is one of the health care providers in this location. To control for researcher bias and to maintain the safety of the patient provider relationship, none of the researcher’s patients were enrolled in the study.

The study was designed to use a sample size of 100. This number was selected because a power analysis demonstrated that this number would be sufficient for this study to attain a power level of .80. (Polit-O'Hara, Hungler, & Polit, D.F., 1999). This calculation was based upon Samar’s (2001) results. Because the emotional aspects of HIV disease as demonstrated in the literature review is more evident than those with diabetes, this further demonstrated the need for this sample size.
3.4 Data collection plan

Subjects were recruited at the clinic by two primary methods: (a) flyers were distributed to the clinic with a telephone number for the prospective subject to call the researcher and (b) clinic staff received information on the project and were to inform the clients of the flyers. Once the participants are contacted, and a meeting time and place arranged that was mutually acceptable, the procedures of the study and the informed consent document were reviewed and explained by the researcher. If the subject agreed to the study, and met the study criteria, the subject signed the consent form and a copy was given to them for their records and another was kept on file by the researcher. Participants were to be paid $25 when they completed the study as remuneration for any expenses that may incur in order to participate. The expected expenses would include transportation and childcare costs.

3.5 Instruments

Data included the ability measurement of EI, the MSCEIT, and a survey that included descriptive data for each participant in the sample. The MEISCT is based upon Mayer and Salovey’s model of emotional intelligence. The MEISCT is an instrument that is designed to yield a total emotional intelligence score as well as individual scores. The individual scores are for each of the four branches of emotional intelligence: Identifying Emotions, Using Emotions, Understanding Emotions and Managing Emotions. Test instructions stated that thirty minutes would be required to complete the test. Norms for this test were based upon a sample of over 5,000 North American
individuals. Patient identifiers were shielded by the use of a coding system. The MSCEIT has been studied with individuals of varying ethnic backgrounds and education. Normative data was collected from over 50 research sites. It has been normed with individuals of both genders who are 17 years of age and older. There are several scores produced by the MSCEIT, the overall, two area scores, four branch scores and eight task scores.

3.6 Reliability of tools

Reliability represents the consistency of the measures obtained. Reliability testing is a measure of the random error in a measurement technique (Weirsma, 2000).

The MSCEIT has a full-scale reliability of alpha = .91. It has been demonstrated that it is highly reliable test at the Branch and Full-scale levels. There are subtasks of this test that are available but were not used for the purpose of this research because they are considered to be somewhat less reliable (Mayer et al., 2002).

The measure of adherence is still an ongoing discussion in the literature and while there is no accurate measure of adherence that is agreed upon, the literature search done for the purpose of this study demonstrated that regardless of measures utilized, a recall of the past 7 days correlated with many different methods of assessment. It therefore was adequate and was used for that purpose in this study.

After discussion with David Caruso, (personal communication, February 8, 2002) the total EQ score and the four branch scores will be used for the purpose of this study. Task scores are less reliable measures of emotional intelligence and are subject to great
variation (Mayer et al., 2002). The researcher, who has undergone training and has obtained certification, will administer the test.

The participant, via pen and paper, will complete the demographic information. Adherence will be assessed, using the method proposed by Liu and colleagues (Liu et al., 2001). The following questions were included:

1. “Many people don’t take their medication perfectly all the time. Over the past 7 days, how many times did you miss a dose of your medication?”

2. “When was the last time that you missed any of this medication?”

3. And another question used a visual analog scale from one to 10 with always, sometimes and never aligned with the numbers. The score was decided based upon the mean of question 1 and 3.

Adherence will be presented as either the subject reported that they were adherent or they missed doses in the previous seven days.

3.7 Safety and confidentiality

Institutional Review Board approval was sought from the researcher’s academic institution, Drexel University which also is the review board for the clinic. All subjects completed and receive a copy of the informed consent to participate in the research study. Subject confidentiality was maintained by assigning a code to each participant. The code was on a subject information sheet that will contain contact information as well as the individual’s identification. Data integrity was maintained by keeping all information in a locked cabinet in the researcher’s office. All survey instruments were identified by the code to facilitate organization.
3.8 Data analysis

Once the surveys were completed, all quantitative data was entered into a computer program, SPSS version 10, for the purpose of analysis. The analysis was conducted in phases and was reported in multiple formats. First, descriptive data was to be presented to describe the number of and demographic information of the sample. Means, standard deviations and range of scores of the MSCEIT was to be presented for the overall score as well as for the four branch scores. The Pearson R correlation coefficient statistical method was to be utilized to assess the relationship between adherence and EQ main and branch scores. Consultation with an expert statistician was sought pre study and post data collection to insure accurate analysis of all data points collected. Overall, the goal of this analysis was to test the researcher’s belief that EQ is related to adherence. Specifically, that higher EQ is strongly related to increased adherence.
CHAPTER 4. RESULTS

This study examined the relationship between emotional intelligence as measured by the MSCEIT and a self-report of HIV positive individual’s adherence to prescribed combinational antiretroviral therapy medications (CART). After receiving Drexel University’s Institutional Review Board approval, subjects were recruited from the HIV primary care clinic. After consent was obtained, subjects completed both the written questionnaire and the MSCEIT. Accrual of subjects occurred over a nine-month period of time. Data was entered into a database utilizing SPSS version 11 for analysis. Tables were created to allow the researcher to look at the scores of the MSCEIT. Each total score and each branch score was correlated with the response question: In the past 7 days have you missed any doses of medication?

Exclusion criteria were limited to an individual’s inability to complete the MSCEIT, which took approximately 45 minutes.

Funding was sought from professional organizations but could not be obtained for this project. The funding was to be used for the remuneration of expenses for each individual subject for the sum of $25. As this was not possible, an incentive was substituted. Each participant was entered into a lottery whose price was fifty dollars.

4.1 Sample

The goal of this study was to enroll 100 subjects, however accrual proved to be difficult. A purposive, non-random sample of 82 adults who are HIV positive and received prescribed antiretroviral medications were successfully recruited via flyers that
were placed in the waiting room of a hospital based HIV clinic. Fifty two data sets from these 82 subjects were complete enough for analysis.

The sample’s characteristics are presented in Table 4.1.

*Table 4.1 Demographic Data*

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>31</td>
<td>60%</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100%</td>
</tr>
<tr>
<td>Black</td>
<td>42</td>
<td>81%</td>
</tr>
<tr>
<td>White</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100%</td>
</tr>
<tr>
<td>AIDS</td>
<td>28</td>
<td>54%</td>
</tr>
<tr>
<td>HIV+ with symptoms</td>
<td>9</td>
<td>17%</td>
</tr>
<tr>
<td>HIV+</td>
<td>12</td>
<td>23%</td>
</tr>
<tr>
<td>Missing data</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100%</td>
</tr>
</tbody>
</table>

The Subjects were 60% men (n=31) and 40% women (n=21), 81% (n=42) African American; 15% (n=8) White and 3% (n=2) listed Other. 53% reported an AIDS diagnosis and 17% reported to be HIV+ with symptoms, and 23% reported being HIV positive without symptoms. All of the participants in this study took CART on a daily basis. 57% (n=30) reported that they had not missed a dose of medications in the previous 7 days. On a 1 to 10 number scale of adherence, designed for this study, in which the question stated, “On the scale below, circle the number that best shows how often you take your HIV medications.” 1 to 10, in which one meant none of the time and 10 equaled all of the time. 25 (48%) reported 10 and 13 (25%) reported a 9 meaning that they took medications 90% of the time. A mean from these two responses was used as the overall adherence score.
4.2 Analysis

The research question for analysis was: Is there a relationship between adherence to medications and emotional intelligence as measured by the MSCEIT?

The MSCEIT scores are reported like traditional intelligence scales with the average score of 100 and a standard deviation of 15. The MSCEIT yields a total emotional intelligence score and the four branch scores, for perceiving emotions, facilitating thought, understanding emotion, and managing emotion.

The total scores indicate an overall capacity to reason with emotion and to use emotion to enhance thought. The total score reflects the capacity to perform well in the four branch areas. The Perceiving Emotions score concerns the ability to recognize how the individual and those around them are feeling. The Facilitating Thought score is the ability to employ feelings and enhance thinking; this ability can also be used for more effective problem-solving and reasoning, and decision making. The Understanding Emotion score reflects being able to label emotions and reason with them. The Managing Emotions concerns one’s capacity to manage emotions successfully. The MSCEIT scores are computed as percentiles, then positioned on a normal curve with an average score of 100 and a standard deviation of 15 (Mayer, Salovey, & Caruso, 2002).

A Pearson’s r test was performed for correlation – the results are illustrated in Table 4.2. This test was examined for the total MSCEIT and with each of the MSCEIT four subscales. When the total scales and subscales were examined separately, no significant relationships were found between any of the MSCEIT branch scores and adherence as noted in Table 4.2.
The MSCEIT total score in this study, which provides an overall index or summary of the respondent’s emotional intelligence, demonstrated a range of 33 to 113 with a mean of 77 with a Std. Deviation of 17. The MSCEIT branch score 1 – Perceiving Emotions had a range of 27 to 136 with a mean of 88 and a standard deviation of 20. The MSCEIT branch score 2 – Facilitating Thought, had a range of 37 to 150, with a mean of 90 and a standard deviation of 22. The MSCEIT branch score 3 – Understanding Emotions, had a range of 52 to 167 with a mean of 83 and a standard deviation of 21. The MSCEIT branch score 4 – Managing Emotions, had a range of 56 to 158, with a mean of 81 and a standard deviation of 17.

There were 3 outlier scores noted, when these were removed the results were still similar, see Table 4.3.

### Table 4.2 Correlations between MSCEIT Branch scores and Adherence

<table>
<thead>
<tr>
<th></th>
<th>EI - BRANCH 1</th>
<th>EI - BRANCH 2</th>
<th>EI - BRANCH 3</th>
<th>EI - BRANCH 4</th>
<th>TOTAL SCORE</th>
<th>Adherence Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI - BRANCH 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1.000</td>
<td>.541**</td>
<td>.171</td>
<td>.134</td>
<td>.707**</td>
<td>.098</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.225</td>
<td>.343</td>
<td>.000</td>
<td>.498</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td>EI - BRANCH 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.541**</td>
<td>1.000</td>
<td>.390**</td>
<td>.400**</td>
<td>.805**</td>
<td>-.126</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.004</td>
<td>.003</td>
<td>.000</td>
<td>.000</td>
<td>.385</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td>EI - BRANCH 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.171</td>
<td>.390**</td>
<td>1.000</td>
<td>.720**</td>
<td>.620**</td>
<td>-.168</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.225</td>
<td>.004</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.243</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td>EI - BRANCH 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.134</td>
<td>.400**</td>
<td>.720**</td>
<td>1.000</td>
<td>.663**</td>
<td>-.012</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.343</td>
<td>.003</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.935</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.707**</td>
<td>.805**</td>
<td>.620**</td>
<td>.663**</td>
<td>1.000</td>
<td>-.035</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.808</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td>Adherence Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.098</td>
<td>-.126</td>
<td>-.168</td>
<td>-.012</td>
<td>-.035</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.498</td>
<td>.385</td>
<td>.243</td>
<td>.935</td>
<td>.808</td>
<td>.50</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
Table 4.3. EQ Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total - EQ</td>
<td>33 – 113</td>
<td>77</td>
<td>17</td>
</tr>
<tr>
<td>Branch 1</td>
<td>27 – 136</td>
<td>88</td>
<td>20</td>
</tr>
<tr>
<td>Perceiving Emotions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branch 2</td>
<td>27 – 150</td>
<td>90</td>
<td>22</td>
</tr>
<tr>
<td>Facilitating Thought</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branch 3</td>
<td>52 – 167</td>
<td>83</td>
<td>21</td>
</tr>
<tr>
<td>Understanding Emotions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branch 4</td>
<td>56 – 158</td>
<td>81</td>
<td>17</td>
</tr>
<tr>
<td>Managing Emotions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean without the outliers was 78, a median of 76, a mode of 74 with a standard deviation of 14.5. The minimum of this set was 52 and the maximum was 102. See Tables 4.4 and 4.5.
Table 4.4 Total Score

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.0</td>
<td>10</td>
</tr>
<tr>
<td>95.0</td>
<td>8</td>
</tr>
<tr>
<td>90.0</td>
<td>6</td>
</tr>
<tr>
<td>85.0</td>
<td>4</td>
</tr>
<tr>
<td>80.0</td>
<td>2</td>
</tr>
<tr>
<td>75.0</td>
<td>0</td>
</tr>
<tr>
<td>70.0</td>
<td>0</td>
</tr>
<tr>
<td>65.0</td>
<td>0</td>
</tr>
<tr>
<td>60.0</td>
<td>0</td>
</tr>
<tr>
<td>55.0</td>
<td>0</td>
</tr>
<tr>
<td>50.0</td>
<td>0</td>
</tr>
</tbody>
</table>

Std. Dev = 14.56  
Mean = 78.2  
N = 49.00

Table 4.5 Total Score Statistics (without outliers)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid</td>
<td>49</td>
</tr>
<tr>
<td>Mean</td>
<td>78.24</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>76.00</td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>14.561</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>
When these results are compared to the test norms this mean was demonstrated as being statistically significant when compared with the general population scores. The general population scores showed an average of 100 with a standard deviation of 15.

The scores were also analyzed to determine if there were any gender differences. Table 4.6 demonstrates that there were no statistically significant gender differences.

Table 4.6 Gender distribution

<table>
<thead>
<tr>
<th>gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL SCORE</td>
<td>MALE</td>
<td>30</td>
<td>77.50</td>
<td>14.292</td>
</tr>
<tr>
<td></td>
<td>FEMALE</td>
<td>19</td>
<td>79.42</td>
<td>15.295</td>
</tr>
</tbody>
</table>

4.3 Limitations

THE MSCEIT compares individuals against the normative sample of over 5000 respondents. Normative data is based on data collected from over 50 research sites from diverse geographic locations, the majority of these sites are from the U.S. In the 50 research sites, there were statistically reliable sample sizes for each ethnic group; however there was a high representation of caucasians and a large proportion had some college experience (Mayer et al., 2002). Another limitation is that the reading level of the MSCEIT, a grade eight reading level (Mayer et al., 2002). While the population at this clinic is a general clinical practice, the study population was not assessed for reading level. Most reading information that health care professionals use for patient education purposes is at the 5th grade reading level (Quirk, P. 2000).

There was great difficulty in accruing subjects. Many subjects stated that they did not have the time to stay to take the test at their regularly scheduled clinic appointment.
While the test instructions stated that the test would take 30 minutes to complete, in reality, for this sample, one hour to complete the study was not uncommon. Given the option to return to take the test, after consent was obtained, many subjects did not return to complete the test even though they stated that they would do so. There were also many subjects that requested individual remuneration to participate in the study and when they found that there was no immediate financial compensation, they refused to participate. Many who consented, took the test home to complete and when contacted to return the completed test, did not return it. After over six months of attempts at data collection, a decision was made to stop data collection and report on the available data.
CHAPTER 5. SUMMARY AND DISCUSSION OF RESULTS

This was an initial exploratory inquiry of a new concept for an old, well-researched, clinical conundrum – adherence to prescribed medications in a population of HIV positive patients. Adherence was measured by subject self report. A minimum of a 90% adherence rate is necessary for adequate control of the HIV virus. The literature described many factors involved in adherence to medications. The factors most often cited in the literature review were: forgetting to take the pills, depression, homelessness, substance abuse, being out of town, being asleep, adverse side effects and being too ill (Chesney, 2000). The emotional factors of living with HIV were many, including, confronting the stigma of HIV, the importance of the relationship of the patient with their health care provider and finally, the impact that emotions may play in HIV disease progression (Robinson, 2001; Bangsberg, 1997; Chesney, 2000). These factors all contain a high level of emotional content and it was felt that they could be used to address the same issues that emotional intelligence (EI) studies. The emotional intersection of HIV disease and adherence to prescribed medications became evident in the exploration of the literature and it became clear that EI might provide some insight into this universal clinical problem. The potential for a correlation of EI, which is the ability to perceive emotions, facilitate thought, understand emotions and manage emotions, to the problem of adherence to medications, was thought to be an avenue for exploration that may prove to be helpful to clinicians to gain insight into caring for people living with HIV.
The literature review demonstrated that there could be a link between an emotionally charged disease, HIV, and ability to take the treatments successfully. If a relationship was demonstrated, then educational interventions could be designed that would improve adherence rates. However, while the answer to this question increased the adherence knowledge base, it did not provide any firm answers to the question of why some individuals are better than others about adherence to medications.

The purpose of this study was to explore the relationship of medication adherence and emotional intelligence. The assumptions at the beginning of this study were that there were still challenges to clinicians on reasons why an individual adheres to medications and others do not. EI was thought to be one innovative avenue to explore. Measuring emotional intelligence, utilizing the MSCEIT, demonstrates an individual’s capacity to reason with emotions and emotional signals, and the capacity of emotions to focus and prioritize decision-making. In this study, no significant relationship was found between the total score or the branch scores of the MSCEIT and adherence to medication. However an analysis of the total EI scores raised interesting questions that will be discussed in this section. The overall rate of adherence to medications by the individuals in this study was that 57%. This result was similar to other studies looking at adherence in HIV disease (Chesney, 2000; USDHHS, 2001). However, this is still not adequate to control the virus because of the problem of viral resistance to the combination of medications (Bartlett & Gallant, 2001).

The Mayer, Salovey & Caruso Theory of Emotional Intelligence served as the theoretical framework for this study. This theory states that EI as an ability can be developed and improved upon if found to be deficient. It was used for this study because
of the proposition that HIV is a disease that fosters strong emotions and that the self care management by the patient of this disease could be impacted by these emotions. The creators of the MSCEIT, Drs. Mayer, Salovey and Caruso were all contacted throughout the course of this study from conception of the study, during the progress of study and finally they were asked to comment on the outcome after reviewing the results. They were supportive throughout this process and they provided some interesting insights to the results. Each of the three theorists noted there were a small number of subjects but that the data needed to be explored as it may illuminate trends. If trends were noted, then they could be reported and analyzed. The major data point evident in this study was the markedly low scores of EQ when compared to the national norms. The most significant finding of this study was the overall low EQ scores of the participants. It is not known if this is specific to just this particular study population or whether it can be applied in general to individuals living with HIV. Mayer, Salovey and Caruso initially all questioned the reliability of the test results. At their request, the results were again reviewed, verified and validated by the statisticians at Multi-Health Systems Inc. (MHS), the commercial source and scorers of the test.

Mayer, Salovey and Caruso also felt that it would be difficult to interpret the findings because there could be so many plausible explanations, as the MSCEIT had not been used with this particular population, of individuals living with HIV disease. EI has been studied with many different groups. EI has been correlated with problem behavior, physical fights, alcohol use, illegal drug use and even knife and gun ownership (Formica, 1998). With adolescents, higher scores appeared to have a better social understanding
and discourage interpersonal destructive behavior around them (Mayer, Perkins, Caruso & Salovey, 2001).

One of the major reasons for such low results could be the intent in which the subjects took the test; one could think that maybe they did not take it seriously. The clinic recruits patients for many types of research studies, new treatment modalities, surveys or laboratory monitoring. In the majority of these studies, the study subjects receive monetary compensation. The notion that they may not have taken the test seriously could be a valid point because many requested payment for the study, a few refused to proceed with the test and some said they would do it, however their demeanor demonstrated reluctance.

Another reason may be that because these are individuals who are living with HIV and AIDS, the symptoms of their illness that may affect their ability to complete the 45-minute test. Fatigue and depression are two common co-existing conditions in individuals with HIV disease. The subjects were not screened for either of these two entities and it is not known which subjects had these or other symptoms that could have been present and affected the testing on the day that they completed the test.

Also, this study did not control for educational level. Nor did the demographic data indicate an individual’s reading or educational level. Printed patient information is traditionally at the 4th to 6th grade reading level and the MSCEIT’s reading level is at the 8th grade. There was no indication provided by the subjects that they were experiencing difficulty with reading the test.

Peter Salovey commented, “One begins to wonder whether low EI is a risk factor for HIV disease. These are very low scores!” (personal communication, March, 2003).
John Mayer (personal communication, February, 2003) concurred and noted the difficulty of working with members of a special group however, he found the trend of the overall low scores interesting that the low scores could put one at risk for HIV.

The literature review for this study demonstrated a relationship between EI and use of alcohol and drugs. Trinidad and Johnson (2002) demonstrated a relationship with alcohol and tobacco with lower EQ scores among adolescents. The study demonstrated that individuals with a high EQ might be able to negotiate peer pressure to make healthier decisions and not use alcohol or tobacco. However, all of these studies used multiple measures to study the various populations. Some measures used were depression surveys and specific risk assessments. This study only looked at one instrument because there no evidence that the MSCEIT was ever used to assess a simple relationship with adherence.

HIV is a disease of risk, and risk assessment has had much attention in identifying that assessment of one’s ability to resist risky behaviors that would lead to a negative outcomes for many adverse events. What is known is that there is no one explanation for any one risk factor (Graczyk, et al 2001). One protective attribute that has been demonstrated to be effective at decreasing risk taking is being competent within the emotional and social context. Interpersonal skills, problem solving, positive outlook on life have all been seen to decrease risk-taking behaviors. Adherence to CART requires a complex approach. Incorporating methods to improve these interpersonal skills should still be considered to improve adherence. One could posit that if further exploration of EI with a larger number of subjects was completed, a correlation between risky behaviors that could result in HIV infection could be demonstrated.
Educational programs have been designed and implemented with a positive outcome impact to decrease risky behaviors. The literature review demonstrated that harmful behaviors, like drug and alcohol abuse, often co-exist with an HIV diagnosis (Miramontes, 1999; Ungvarski & Flaskerud, 1999). As a method of preventing HIV infection, one may therefore, theoretically, utilize principles of improving emotional intelligence to help people negotiate safe sex and avoid abuse of substances that could alter one’s ability to negotiate healthy behaviors. Curriculum can be designed for individuals that would enhance their competence with emotionally charged behaviors such as drugs used to escape emotions. These individuals could be looking for emotional outlets or support by engaging in sexual practices with multiple partners.

EI has been demonstrated to have a correlation between a high score and the ability to achieve close and affectionate relationships. If one would look at those individuals most at risk for HIV including substance abusers and individuals with multiple sexual partners, then the overall low results of this study would make sense. However, this study did not look to answer this question. One could conclude that EI could certainly still hold some answers to working successfully with individuals at risk for HIV disease.

HIV, as a disease has reached beyond traditional methods of the study of its treatment and its science. Similarly, EI, as a body of knowledge, has reached beyond traditional views of intelligence by acknowledging the impact of emotions. EI continues to raise questions about the role of emotions in an individual’s personal as well as social functioning.
Research on the care of individuals with HIV disease requires a constant review of the literature. Pradier (2002) continues to study and present his work on psychological interventions to improve adherence. More recently, Paul Farmer (2003) from the Harvard Medical School, presented at the 2003 Retrovirus Conference a report demonstrating success with utilizing accoumpanteur’s, lay workers from the community, as a form of biosocial intervention to improve adherence to CART in Haiti. These accoumpanteur’s are responsible for insuring that the medications are taken every day through personal contact. This work also illustrated trends of diminished AIDS-related stigma and a more widespread interest in prevention efforts of people living with HIV. This work gives further credence on the importance of emotions in dealing with HIV disease.

While the challenges of the questions of adherence were not answered in this research study, more questions have been stimulated for future study. Of most importance would be to longitudinally study a population of similar groups of individuals at risk for HIV infection, substance abusers, men who have sex with men, sex workers, and to look at the differences in the scores of EI and correlate with sero-conversion of HIV disease. At this point one could design and implement an educational intervention improving one’s EI to determine if this decreased transmission of HIV disease among high risk individuals. Another line of inquiry would be to look at a much larger group of individuals with HThis study used EI to look at one group of people. It is limited in that EI only gives one view into the complexity of this population. However, it is this researcher’s opinion that it is still useful to explore the use of EI because of the demonstrated results of this particular population. It may, in further studies, demonstrate
it’s importance for treatment and educational needs as well as for prevention efforts. The EI framework can act as a guide to design educational interventions as well as to continue to be used as a research instrument in this population.

Another key point is the use of the MSCEIT to assess these individuals. There are three measures of EI. EI as proposed by Mayer, Salovey and Caruso, is framed as an ability for intelligence. EI as defined by Reuven Bar-On (1988) is a part of an individual’s personality. Goleman(1998) places EI in the context of performance. All of these theories share common ideas. While each may use different terminology, the essence is in four major domains: self-awareness, self-management, social awareness and relationship management (Goleman, 2001). All three of these theories have an assessment tool. The assessment tools use either the intelligence model like the MSCEIT or a performance model like one proposed by Goleman. MSCEIT was picked because this researcher saw adherence as an ability. However, adherence to medications is not only a task that is an ability, but it is also requires performing a healthy behavior. Using multiple measures of EI could, again, be used to further define the relationship between adherence and EI. The MSCEIT assessment is complex and it may not be the best tool to have used with this particular population. It measures a reflection on aptitude rather than behavior. Since adherence is complex, it may be necessary to use multiple measures to study or assess an individual’s EI. The answer to that may not be known until further studies can be done to compare the different measures against the question of adherence.

If this researcher were to look at this question again, based upon this experience, the design would be improved. Funding for this study providing a stipend for research subjects would be key and used as an incentive to attract more HIV positive individuals
to this study. It would be interesting to also look at the correlation of disease progression
and possible imaging techniques such as magnetic resonance imaging (MRI) or other
techniques which could assess the midbrain, the center of emotional control. It might also
be necessary to assess educational and reading level so that an individual could complete
the study without frustration. Past histories of abuse, sexual, physical and emotional
should also be analyzed for their impact. Some qualitative review to explore the
relationship that the study subject has with the provider would also be helpful. An
assessment of the individuals risk taking behaviors or tendencies should also be an area
of future study.

In summary, adherence remains a complex clinical problem. People living with
HIV face many issues, adverse effects from not being able to adhere to medications pose
challenges not only for the individual patient but also for the concerned health care
provider. Improving the patient’s quality of life, while maintaining good control of the
virus, continues to be a critical part of caring for individuals with HIV. The complexity
of this disease as well as its’ seriousness requires novel approaches. While this study did
not solve this particular clinical problem of adherence, it provide some potential areas for
further study as well as potential for new insights into this complex issue.
LIST OF REFERENCES


VITA

SUZANNE WILLARD

EDUCATION
Drexel University, 2003 PhD, School of Education
University of Pennsylvania, August 1990, MSN - Primary Care Nurse Practitioner - Adult Health.
La Salle University, Philadelphia, PA. 1988, B.S.N.
Roxborough Memorial Hospital, School of Nursing, Philadelphia, 1984, Diploma.
Community College of Philadelphia, Philadelphia, PA, 1972, AA

PROFESSIONAL EXPERIENCE
Current: DREXEL UNIVERSITY, College of Nursing and Health Professions, Philadelphia, PA ; Assistant Professor - Nursing
9/90 to 3/99
9/94 to 12/96
9/89 to
9/90
ST. CHRISTOPHER’S HOSPITAL FOR CHILDREN, Philadelphia, PA
LASALLE UNIVERSITY, SCHOOL OF NURSING
PHILADELPHIA, PA
PHILADELPHIA PA, Research Assistant

12/96
12/96
9/89 to
9/89 to

8/90
12/96

8/90

PHILADELPHIA, PA
PHILADELPHIA PA, Research Assistant

12/96

PHILADELPHIA, PA

PHILADELPHIA, PA

HONORS
Women with a Mission – Appreciation Award – August 2001 –
Association of Nurses in AIDS Care, Frank Lamendola Achievement Award for Leadership in
HIV/AIDS Care, November, 2000
Sigma Theta Tau, Nursing Honor Society, elected as a community member, 1992
University of Pennsylvania, Research Assistantship, School of Nursing, 1990
Temple University Hospital, Department of Nursing, Recognition of Achievement, 1989, annual
award to nurse providing significant service to the organization

LICENSE
Commonwealth of Pennsylvania - Registered Professional Nurse - RN 2666985
Commonwealth of Pennsylvania - Certified Registered Adult Nurse Practitioner. - VP-001737-C

PUBLICATIONS (selected)
Panel on Clinical Practices for the Treatment of HIV Guidelines for the use of antiretroviral
agents in HIV-infected adults and adolescents. . Annals of Internal Medicine. 137(5 Pt 2):381-
433, 2002, Sept 3 Panel member
Association of Nurses in AIDS Care
positive Pregnant Women, Journal of the Association of Nurses in AIDS Care, Jan/Feb 2002
Willard, S., Dean, L (2000) AIDS In the Elderly – CE offering, ADVANCE for Nurses,
November, 2000