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Causal Pathways Between Severe Mental Illness and Behaviors Related to HIV: Patient Perspectives

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Abstract

The purpose of this study was to identify causal pathways between HIV infection and severe mental illness. Data were collected through open-ended, semi-structured interviews. An integrated approach to the analysis, using inductive and deductive coding, was used to identify patterns among respondents. Standardized instruments were used to characterize the sample in terms of risk behaviors, physical and mental functioning and depression. Twenty-six men and women with a diagnosis of HIV and unipolar depression (n=11) or schizophrenia/schizoaffective vs. bipolar disorder (n=15) participated. For persons with unipolar depression, the HIV diagnosis often preceded depressive symptoms. For persons with schizophrenia/schizoaffective vs. bipolar disorder, mania and psychosis symptoms often preceded HIV. Substance use, incarceration and adverse childhood experiences were common across diagnoses. Attention to the directionality of effects between mental illness and HIV has important implications for anticipatory guidance for infectious disease specialists, primary care providers and public health practitioners as well as policymakers.

Keywords

HIV; major depressive disorder; schizophrenia; life history interviews; qualitative research

Introduction

The sources of risk and direction of effects between HIV infection and mental illness remain poorly understood and relatively little work has been done on identification of syndemic effects, as well as prevention and treatment for people with these complex, co-occurring

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Conflicts of interest

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conditions. Consequently, there has been a missed opportunity to provide informed guidance to clinicians faced with patients who have these co-morbid problems. Syndemic illness refers to the co-occurrence of two or more diseases or conditions within a population where there is some biological interaction or synergy that exacerbates the negative effects of the diseases or illnesses and complicates treatment (Littleton & Park, 2009; Singer & Clair, 2003). There has been an increasing recognition of a syndemic including HIV, substance use and mental illnesses encompassing schizophrenia spectrum disorders, depression, bipolar disorder, anxiety disorder and post-traumatic stress disorder, and others. There has been a growing interest in syndemics and their treatment as the biomedical and public health communities have increasingly recognized that health disparities are largely linked to social conditions including social ecological factors such as poverty, stress, violence, and other adverse conditions that contribute to environmental toxicity (Littleton & Park, 2009).

A now established body of research documents that persons with mental illness are at increased risk for contracting and transmitting HIV (Walkup, Crystal, & Sambamoorthi, 1999) (Blank, Mandell, Aiken, & Hadley, 2002). This increased risk is thought to be due to high rates of substance use including injection drug use, sexual victimization, sex work, and other sexual activity that could result in viral transmission among those with mental illness (Gottesman & Groome, 1997). Recently, there has been an increased emphasis on having both inpatient and outpatient mental health settings offer routine, opt-out HIV testing to improve case finding among persons with mental illness and promoting their linkage to infectious disease care (Blank et al., 2014). In fact current CDC testing guidelines recommend routine opt-out testing in all clinical settings where the background seroprevalence in the community exceeds 1% (<http://www.cdc.gov/hiv/guidelines/testing.html>).

A recent study showed that prevalence of HIV was four times higher among persons receiving mental health services in Philadelphia and Baltimore (Blank et al., 2014). A total of 1062 individuals were tested for HIV who were receiving services in three settings: University-based inpatient psychiatric units (n=288), Assertive Community Treatment programs (ACT, n=273), and Community Mental Health Centers (CMHCs, n=501). The proportions with confirmed positive HIV test results were 5.9% for inpatient units, 5.1% for ICM programs, and 4.0% for CMHCs. HIV infection was associated with black race, identifying as gay or bisexual, HCV infection, and overall psychiatric symptom severity.

Adherence to HIV treatment regimens may be markedly compromised when a person has a mental illness, which can pose a public health threat by increasing community viral load and potentially developing treatment resistant virus strains (Gonzalez, Batchelder, Psaros, & Safren, 2011). When this happens, the person with mental illness may serve as a vector of HIV transmission. Therefore, there is a need for methods of improving their access to HIV treatment and reinforcing their treatment adherence. Research also makes clear that these adverse outcomes are far from inevitable, as people with mental illnesses receiving good quality care can achieve adherence rates comparable to non-mentally ill counterparts. In fact, the evidence reviewed here shows that they can adhere to treatments with appropriate supports, and some have found that they are less likely to discontinue antiretroviral therapy than those without mental illness (Himelhoch et al., 2009).

Prevalence estimates of major depressive disorder among persons living with HIV range from 20% to as high as 37% (Kessler et al., 2010; Simoni et al., 2011). This is more than three times the rate of major depression in the general population, which has been shown to range between 5% and 12% (Kessler et al., 2010). Because HIV is a chronic and life-threatening illness and like other such illnesses, can be stressful to manage, people living with HIV are particularly vulnerable to depression and other affective disorders. The life-threatening nature of HIV infection itself may instigate fears of impending mortality. Moreover, the medical sequelae of HIV infection such as HIV associated neurocognitive disorders, associated opportunistic infections, and the side effects of antiretroviral treatment can mimic symptoms of depression (i.e., fatigue, concentration problems, somatic symptoms, decreased appetite/weight loss). From a cognitive-behavioral perspective, these physical symptoms can be part of a cycle of continued depression (Simoni et al., 2011). Other factors that might account for the high level of depression and other affective disorders among persons living with HIV are unique to HIV. Specifically, these individuals disproportionately belong to socially disadvantaged and marginalized populations who are already at risk for depression because of their racial, ethnic, or sexual minority status, poverty, current or prior substance use, sex work, and trauma.

The mechanisms by which mental illness and HIV infection interact and the temporal sequencing of disease onset remains understudied and is vitally important to inform efforts at prevention and treatment. Because the onset of symptoms of mental illness and subsequent dates of diagnosis and treatment are as highly variable and disjointed as the dates of HIV infection, diagnosis and treatment, efforts at understanding the developmental trajectories of this syndemic have been lacking. However, a qualitative life history approach using grounded theory among persons with mental illness who are HIV seropositive is a first step in understanding the direction effects in the syndemic.

The goal of this study was to conduct preliminary work to enable us to identify the causal pathways between the development of symptoms of a severe mental illness (SMI) such as schizophrenia or major depression (although during analysis, some were found to more likely meet criteria for bipolar disorder or schizoaffective disorder) and the onset of behaviors that contributed to HIV infection. Our objective was to generate hypotheses about the causal pathways between the development of schizophrenia and major depression in men and women living with HIV and the onset of behaviors that contribute to HIV infection among people enrolled at COMHAR, a community mental health agency. COMHAR is a nonprofit community behavioral health agency that provides services to persons living with both mental illness and HIV by means of three programs: PACTS (outpatient behavioral services), COMPASS (supportive independent living), and the Community Living Room, a community integrated recovery center. Our specific aims included: 1) identify perceptions of the timing and sequence of the emergence of mental health symptoms among a purposive sample of men and women living with schizophrenia or major depression, and 2) identify perceptions of the timing and sequence of the emergence of behaviors that contributed to HIV infection among a purposive sample of men and women living with schizophrenia or major depression.

Methods

Recruitment

Participants were recruited from COMHAR. The Behavioral Health Director of Specialized Services identified individuals who had a diagnosis of depression or schizophrenia who were living with HIV. He scheduled them for an interview with one of two trained interviewers from the Mixed Methods Research Lab at the University of Pennsylvania.

Human Subjects Approval

The study was approved by the Institutional Review Board (IRB) at the University of Pennsylvania and by the leadership of the community mental health agency. All participants provided signed informed consent.

Data Collection

Sampling Frame—Open-ended semi-structured interviews were conducted at COMHAR with individuals identified as living with both HIV and a severe mental illness (SMI). Individuals were recruited with the aim to have an equal number with (1) unipolar/major depression or (2) schizophrenia based on the clinical diagnosis documented in their medical records.

Semi-structured interviews—Interviews were conducted in a quiet private space at COMHAR, following a semi-structured interview guide. Interviews were semi-structured, meaning that while each interviewer asked the same questions of all participants, they also encouraged open-ended exploration of respondents' answers with probes. The questions asked of all interviewees included an exploration of daily life living with HIV and a mental illness, circumstances and timing around diagnosis of each of the illnesses, participants' perceptions about the relationship between the illnesses, and participants' advice for health professionals caring for people with HIV and a mental illness. A copy of the interview guide is attached as an appendix. The interviewers felt that they had achieved thematic saturation on key themes after 26 interviews and so no further interviews were conducted, in line with best practices for qualitative research and grounded theory methods (Bernard & Ryan, 2010; Curry et al., 2013)

Psychometric questionnaires—In addition to semi-structured interviews, participants also filled out a demographics survey, SF-12 (Ware, Kosinski, & Keller, 1996), BASIS-24 (Eisen, Normand, Belanger, Spiro, & Esch, 2004), the Quick Inventory of Depressive Symptomatology (QIDS-C)(Rush et al., 2003) and a Risk Assessment Battery (RAB) (Donenberg, Emerson, Bryant, Wilson, & Weber-Shiffrin, 2001), with the assistance of the interviewers. This information was then entered into REDCap (Research Electronic Data Capture), a HIPAA compliant survey and data analysis software. Results from these instruments were used to characterize the sample.

Data Analysis

Interviews were transcribed, de-identified and then entered into QSR NVivo 10.0 software (QSR International Pty Ltd. Version 10, 2012) for systematic qualitative analysis through

coding. A codebook was developed by the study team by conducting a line by line reading of five transcripts. Key ideas were identified, and each idea was operationalized into a specific code.

This codebook was then applied to the dataset using NVivo software, and the codebook was further refined by the two interviewers who also completed all of the initial coding. Inter-rater reliability was calculated using the function in NVivo designed for this purpose. Coding was accepted when the percent agreement between the two coders was over 90%. Transcripts were also coded by a clinical psychiatrist for classification of psychiatric symptoms. Transcripts were read line by line and specific psychiatric symptoms were identified, such as depression symptoms (e.g., depressed mood, anhedonia, changes in sleep, low energy, hopelessness, suicidal ideation), manic symptoms (e.g., decreased need for sleep, increased energy, racing thoughts, increased impulsive or risky behavior), and psychosis symptoms (e.g., hallucinations, delusions, paranoia). Substance use was also coded for with specific substances mentioned by interviewees, including marijuana, cocaine, opiates, and alcohol. These symptoms and reports of substance abuse are subjective as they were based on interviewee self-report of their past experiences leading to diagnosis with a mental health condition.

Following clinical coding, summary timelines were constructed by the clinical psychiatrist author for each interviewee tracing life events and the chronology between HIV and mental health diagnoses identified by the interviewee. The other two coders independently did timeline constructions, and those were then compared with the psychiatrist-author's timelines. There was strong agreement among coders in the timeline summaries. These timelines were then examined across groups of interviewees with specific mental health diagnoses to identify patterns in how they understood the relationship and/or causal direction between HIV and mental illness.

Results

Clinical Grouping and Psychiatric Symptoms

Twenty-six men and women with unipolar/major depression (n= 11) and schizophrenia/schizoaffective vs. bipolar disorder (n=15) participated in open-ended semi-structured interviews. Results of quantitative psychometric testing are presented in Table 1.

Mean scores on the physical and mental functioning scales of the MOS SF-12 for all participants are below the national norm. Individuals with unipolar depression and schizophrenia/schizoaffective vs. bipolar disorder reported roughly equivalent symptom severity on the BASIS-24 instrument. Mean scores on the QIDs for individuals with unipolar/major depression were more severe than for those with schizophrenia/schizoaffective vs. bipolar disorder. In the quantitative results, on average, individuals with unipolar depression reported more behaviors that could lead to HIV infection (e.g., sex with multiple partners, sex without barrier protection, injection drug use, etc.; see RAB results, Table 1). The psychometric testing findings were collected just prior to the interviews and so do not provide longitudinal information of psychiatric symptom onset in relation to HIV

status. The interviewees' qualitative accounts of that timeline serve as the main source of data for the remainder of this report.

In order to systematically analyze the psychiatric symptoms reported by the interviewees, the clinical coder (psychiatrist) independently classified each interviewee with a diagnosis based on self-reported symptoms (e.g., schizophrenia or schizoaffective disorder vs. bipolar disorder, in cases where discrete periods of manic symptoms were reported) without knowing what their medical records diagnosis was. Following this clinical coding, the medical records diagnosis was then compared for all interviewees. The clinical coding matched all interviewees' original diagnoses except for four individuals, who had self-reports different from their medical record diagnoses.

There were three individuals whose medical records diagnosis indicated depression, but self-report symptoms matched schizoaffective disorder vs. bipolar disorder (manic symptoms) and one individual whose medical records diagnosis was schizophrenia but self-report of symptoms and medications taken met criteria for major depression. As a result, these four interviewees were grouped with others who had similar self-reported symptoms, rather than by their medical records diagnosis. For example, there were individuals with schizophrenia who also reported manic symptoms, making a diagnosis of schizoaffective disorder more likely, and so any interviewees reporting manic or psychotic (auditory hallucinations, paranoia, delusions) were grouped together in the schizophrenia/schizoaffective vs. bipolar disorder group. In the final classification, there were 11 individuals in the depression symptom group and 15 individuals in the schizophrenia/schizoaffective vs. bipolar disorder group. Notably, there is substantial symptom overlap among distinct psychiatric diagnoses in our clinical experience as well as in the diagnostic criteria included in the DSM-5 (e.g., manic symptoms can be seen in schizoaffective disorder as well as bipolar disorder; major depressive episodes clinically look nearly identical in individuals with unipolar and bipolar depression which often results in diagnostic confusion) (Diagnostic and statistical manual of mental disorders, 2013).

Exemplary quotes from interviewees about their self-reported psychiatric symptoms are presented in Table 2 sorted by symptom classification group (unipolar depression vs. schizophrenia/schizoaffective vs. bipolar disorder). The interviewee who is quoted under "manic symptoms" in Table 2 had an official medical record diagnosis of schizophrenia but self-reported a diagnosis of bipolar disorder. Under psychosis symptoms, the most common reported were auditory hallucinations. Suicidal ideation was a very common symptom reported among the interviewees. Symptoms of major depressive disorder self-reported by interviewees included dysphoria (sad/blue mood) and anhedonia (loss of interest in doing things) (see Table 2, "unipolar/major depression group").

HIV and Mental Illness: Pathways and Timelines

To analyze the potential relationship between HIV and mental illness symptoms, we constructed timelines from interviewees' narratives showing in what sequence they recalled the onset of HIV symptoms and mental illness symptoms. These narratives/timelines were complex, with a number of mediating factors occurring around HIV diagnosis and mental illness such as drug use and being in prison.

We found that there were different pathways in the relationship between HIV and mental illness symptoms in individuals who reported schizophrenia/schizoaffective vs. bipolar disorder symptoms compared to those who only reported unipolar depression symptoms. For those in the depression group, the HIV diagnosis often preceded depression while in the schizophrenia/schizoaffective vs. bipolar disorder group, mania and psychosis symptoms often preceded HIV (Figure 1).

In the unipolar depression group, HIV often came first and then depression followed (sometimes with suicidal ideation) after as a result of hopelessness or feelings of futility of life after getting the diagnosis. The account below from an interviewee about the day of diagnosis with HIV illustrates this sense of futility and how depression followed:

He was my family doctor. I had been six months laid up in bed. It's funny, you know, you had like this little man in the back of your head going, no, you don't have it. No, you're fine, you're fine, you're fine. And then when he asked me to come into the back room – a room that I had never been in before – and he came into the room and he says, you're HIV positive. And it's like that little man is like crushed, kind of like Monty Python and the big foot comes down on the man. And that was it. I just – and then it's like the depression just took off right from there... Let's say the day that I was diagnosed [with HIV]. Everything became transparent. Wolves, buildings, everything. Just see through. See through. Like nothing seemed to make any kind of solidification. There was no solidification of life. And you start to get feelings of like – you know, like me and you having this conversation right now. Like, why am I talking to you? You're dead. I'm dead. You're dead, why are we talking? What's the point of all this?

Many interviewees mentioned suicidal ideation after a diagnosis of HIV because of this sense of futility. Table 2 includes two exemplary quotes illustrating this point. In the unipolar depression group, it was more common for interviewees to say they did not have symptoms of mental illness prior to the depression which came after their HIV diagnosis. However, suicidal ideation after a diagnosis of HIV was reported by both individuals in the depression and schizophrenia/schizoaffective vs. bipolar symptom groups.

In the schizophrenia/schizoaffective vs. bipolar disorder group, mental illness symptoms more often preceded the HIV diagnosis than in the unipolar depression group. Interviewees who remembered having manic or hypomanic symptoms thought those may have been related to behaviors which contributed to HIV infection. For example, one interviewee said:

I really didn't know what the disease was, coming from – I knew about AIDS and the stereotype that people had about it. But I never thought I would catch it. And I was having a lot of unprotected sex. I get like that when I get manic, I just let go and just feel as though I could do whatever. And this one particular time, I went to the doctors, because I knew I was having unprotected sex...when I'm manic, I do like oral jobs, but it's in my mind, that okay, this is how you got HIV in the first place.

Another interviewee with a diagnosis of schizophrenia described hallucinations starting at a young age, some of which were command hallucinations to engage in behaviors that may have contributed to HIV infection:

A lot of people don't know, is that I was hearing these voices as a kid, because I was always by myself...But most of the time, they would talk to me, for where – they had me stealing. They had me going places. They had me being with grown men, having sex with them and all types of stuff like that.

In both of these interviewees' narratives, and others from the schizophrenia/schizoaffective vs. bipolar symptom group, mental illness symptoms such as hypersexuality or disinhibition associated with hypomania/mania or command auditory hallucinations (common in schizophrenia and schizoaffective disorder as well as bipolar disorder with psychotic features) appear to have enhanced the probability of HIV infection.

It is also notable that interviewees in the schizophrenia/schizoaffective vs. bipolar disorder group were more likely to see no connection between their HIV and mental illness than those in the unipolar depression group. In other words, this subgroup of interviewees viewed their HIV and schizophrenia/schizoaffective vs. bipolar disorder as co-occurring illness rather than related in any way. For example, one interviewee and interviewer had the following exchange:

Interviewer So, how do you see your schizophrenia and your HIV related?

Interviewee They different – totally different diseases.

Interviewer Totally different? Okay. Can you tell me –?

Interviewee HIV is in the blood. Schizophrenia's in the mind.

Interviewer Okay. Did you ever think that they were connected in any way?

Interviewee Uh-uh [no].

A few others in the schizophrenia/schizoaffective vs. bipolar disorder group gave similar answers when asked about the relationship between HIV and mental illness, whereas most individuals in the unipolar depression group saw a relationship between depression and being diagnosed with HIV. There were also interviewees in the schizophrenia/schizoaffective vs. bipolar disorder group who reported feeling depressed and hopeless after being diagnosed with HIV, similar to the primary pathway for the depression group above in Figure 1.

Common Underlying Factors: HIV and Mental Health Intersections

There were some common themes mentioned by interviewees in both mental illness groups. These themes seemed to be intersecting with both HIV and mental health, but in this study, did not have a clear relationship with only depression or schizophrenia/schizoaffective vs. bipolar illnesses.

Substance use was a common theme mentioned by interviewees in both the depression and schizophrenia/schizoaffective vs. bipolar disorder group. Many people reported using more than one substance, including alcohol. Intravenous use and other forms of substance use were both common in the sample. Some interviewees reported self-medicating their emotional distress with substances. There was not a clear pathway pattern in this small data set between timing of substance use and onset of HIV diagnosis, unlike the mental health symptoms as noted above. Interviewees reported using substances both before and after their HIV diagnosis.

Incarceration was also a common theme mentioned by interviewees. Some talked about getting their diagnosis of HIV when they were in prison. This theme was mentioned when interviewees talked about accessing in health care. Those who raised this issue said they were first given medical or psychiatric care for their HIV and/or mental health diagnosis when they were incarcerated.

Finally, adverse childhood experiences were frequently raised in interviewees' narratives. Physical abuse, emotional abuse, and sexual abuse earlier in their lives were common experiences. Some interviewees linked these experiences to their later experience of mental illness. In addition, interpersonal violence in intimate relationships was also a common experience mentioned by interviewees, particularly by the women. Several interviewees in both the unipolar depression and the schizophrenia/schizoaffective vs. bipolar disorder group also mentioned doing sex work to make income because of adverse experiences they had faced in life, which they thought might have contributed to their HIV infection.

Substance use, incarceration, and adverse experiences in childhood and later in life intersected with interviewees' narratives in complex ways and at different points in the chronological trajectory they shared about how HIV and their mental illness diagnoses were related.

Discussion

This mixed methods study demonstrated that individuals living with both HIV and mental illness perceived some common pathways in the relationships between their diagnoses. Individuals with unipolar depression often developed symptoms after the HIV diagnosis in relation to fatalism and hopelessness, just as anyone might one when given a diagnosis of a potentially life threatening illness. It appears that direction of effects for those with schizophrenia/schizoaffective vs. bipolar illnesses are more complex. Participants with a history of psychotic/manic symptoms self-reported behaviors that might result in HIV infection as a result of their mental illness ((hypo)manic symptoms resulting in increased sexual activity, for example), and commonly felt their mental illness preceded the HIV diagnosis. However, a substantial subset of these patients lacked any insight into the relationship between the risk behaviors that occurred in the prodromal phase of schizophrenia, for example, and subsequent HIV infection. Depression and suicidal ideation were common among all individuals in the interview sample, as was drug use, incarceration, and adverse childhood experiences.

These results suggest that there are broad syndemic factors underlying both HIV and mental illness that put certain individuals or populations at risk for both HIV and mental illness. For example, poverty over multiple generations raises the risk of unstable family structures, adverse childhood experiences, and exposure to substance abuse early in a child's life. All of these factors share risk of broad disease burden and are independent risk factors for both HIV and mental illness in the same individuals. Past studies indicate that the zip code in which a person is raised is one of the greatest predictors of future physical and mental health (Eberhart et al., 2013). Structural inequality in income, neighborhood safety, and access to health care are some of the interacting variables that come together to result in health disparities of these types. This study underscores the importance for future biomedical/epidemiology research on HIV and mental illness to examine structural factors and social determinants of health that independently put individuals at risk for multiple endophenotypes of physical and mental illnesses (Quinn, Reed, Dickson-Gomez, & Kelly, 2018). Such a focus highlights the importance of a multi-level approach to prevention that incorporates policy and resource allocation alongside changes in individual level behavior. The accounts of interviewees who initially received their HIV diagnosis in prison also raise further questions for future research about access to health care in vulnerable populations and in low-income areas in the U.S.

This study also has implications for primary care providers and public health practice as well. For children and adolescents who show signs of bipolar disorder or psychosis, early education for them and their caregivers about sexually transmitted infections and intravenous drug use is important for prevention of HIV (Tennille, Solomon, & Blank, 2010). In addition, primary prevention of HIV may also require screening for early signs of bipolar disorder or psychosis in adolescents. If prodromal symptoms for bipolar disorder or psychosis are detected in primary care, quick referral to specialty mental health care is critical. Early intervention can maximize functioning and outcomes for these youth both in terms of their mental health and physical health. In addition, counseling them and their families about risks of early sexual behavior and drug use is important. Anticipatory guidance (education about what early signs to look for) of the symptoms of hypomania and mania is also critical to help these youth and caregivers prevent behaviors that may contribute to HIV infection. Bipolar disorder can first present with depression symptoms, and so providing education to depressed youth and caregivers about potential symptoms for hypomania/mania may help with earlier detection and prevention of severe manic episodes and the hypersexual activity that can come with them.

These results also have implications for infectious disease specialists who care for people living with HIV who should consider adding depression screening to standard clinical practice. The way in which an HIV diagnosis is given to patients is also critically important for primary care providers and infectious disease specialists to consider. While most physicians know that modern care for HIV makes it a manageable chronic illness, many patients continue to see it as a fatal disease. There also continues to be ongoing stigma related to HIV, and this poses a barrier to both widespread testing for HIV and accessing care for individuals living with mental illness. For the interviewees in this study, fatalism and hopelessness quickly followed a diagnosis of HIV. In that first clinical contact where an HIV diagnosis is given, sharing information about modern care and giving them hope is

critical. Sharing the current prognosis for HIV as a treatable, manageable illness may help to prevent fatalism, address stigma, and is essential to prevent individuals from descending into a depressive episode. Frequent depression screening of individuals recently diagnosed with HIV may also help to prevent intractable depression from developing in this population(Blank et al., 2014).

The main limitation of this study is its small sample size and that it is not necessarily representative of all individuals with unipolar/major depression or schizophrenia/schizoaffective vs. bipolar illnesses. The interviewees were recruited from a single community mental health organization, and also may not reflect all of the perspectives of those who are not connected to community-based mental health care services. Finally, the data are self-reported by interviewees, and so the relationships they see between HIV and mental illness may be subject to recall bias. Nevertheless, this study presents novel findings on the potential pathways by which HIV and mental illness may be related, providing new direction for future studies.

Further research needs to be done with larger sample sizes on the pathways/relationships between HIV and mental illness diagnoses, which this study suggests may be quite different for unipolar/major depression and schizophrenia/schizoaffective vs. bipolar disorder. Intervention trials should be developed to test strategies for enhancing behavioral skills of those living with mental illness to reduce the probability of HIV transmission as well as strategies to improve mental health screening and supports for those living with HIV. Primary care and community mental health center settings provide an important opportunity for research to better determine the role early screening and detection of mental illness plays in the reduction of HIV transmission. Integrated care models, in which behavioral health providers partner with primary care providers to serve as consultants in helping them manage psychiatric illness have great promise as a strategy for reducing HIV infection rates. Future research should also examine how screening for mental illness in infectious disease care, particularly for depression, and subsequent treatment and referral to specialty mental health care helps to reduce the disease burden of HIV. For any of these types of interventions and prevention strategies to work, it is critical to work with policy makers to provide seamless access to health care for people who struggle with behavioral health, social, economic, and environmental stressors.

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Depression Group Schizophrenia/Schizoaffective vs. Bipolar Disorder group **Figure 1.**

Relationship between HIV and mental illness symptom pathways

Table 1

Mean scores on standardized instruments

	Schizophrenia/Schizoaffective vs. Bipolar Disorder	Unipolar/Major Depression
	mean (SD)	mean (SD)
PCS	46.22 (11.69)	44.86 (10.46)
MCS	40.50 (10.05)	41.90 (11.18)
BASIS total	1.49 (.83)	1.44 (.72)
QIDS total	8.21 (.83)	12 (7.40)
RAB total	3.23 (1.94)	5.09 (7.12)
Key		
The mental (MCS) and physical (PCS) component scores of the SF-12 are normalized and range from 0 to 100 with higher values indicating higher functioning. A score of 50 is considered the national norm.		
Higher scores on the Basis-24 total and the 6 domains indicate greater symptoms or severity.		
The QIDS can be characterized as follows: 0–5 No depressive symptoms 6–10 Mild depressive symptoms 11–15 Moderate depressive symptoms 16–20 Severe depressive symptoms 21–27 Very severe depressive symptoms		
Higher RAB scores indicate more risky behaviors		

Table 2:**Exemplary Quotes on Self-Reported Psychiatric Symptoms**

Unipolar/Major Depression Group	Schizophrenia/Schizoaffective vs. Bipolar Group
<p>Suicidal ideation:</p> <p>1) And a friend of mine, he hung himself when he found out he had the virus. Me, I asked a drug dealer to shoot me when I had – when I found out – when I had the virus. He thought I was crazy. He was more frightened of me than I was of him, because he figured he'd get it.</p> <p>2) When I first found out, that's when I tried the suicide myself and everything. I hanged up then the police came and cut me down. I: That was when you were first with schizophrenia or with – R: With HIV, yeah. All that came down on me. So I just wanted to end my life like that. And – because I said, well, I'm dying anyway, I might as well just go all out with it.</p>	<p>Manic symptoms (Irritable, impulsive)</p> <p>After I was diagnosed with – I had a full – I had diagnosed with full blown AIDS, and so I was in the hospital for three months. And then when I came out, I had some kind of episode. And I don't know if it had to do with depression, but it was like a manic episode where I was cussing and my ex-wife said I was – I would get naked and just take off my clothes and walk outside – just all kinds of stuff. And I would put my hand around her neck. One time I put my hand around her neck, and it got real, too. So that was the first time ever that that happened to me, and it took me to a psychiatric ward. And that was my first time being in there, and that's the first time I was on psychiatric medicine. And they told me at that time I was bi-polar. So I was having some kind of episode.</p>
<p>Dysphoria (Sad/blue mood)</p> <p>Now, I'm always looking at the worst part of the whole picture. I don't think that I'm gonna ever get somebody that's positive with it. I always think negative about it. And that ain't nothing, but [inaudible 00:02:07], because nothing bright comes from out of my head. Everything is on the negative side. And I was never a negative person.</p> <p>Anhedonia (Loss of interest)</p> <p>Now when I do have depression, that means not eating, not sleeping, not answering the phone, isolating. And one of the reasons why I'm on – I'm permanently disabled is because I just won't show up. And I won't care. I won't care that I didn't show up. Because I'm depressed, and that's a problem in life. That's a problem in life. And the question was again?</p>	<p>Psychosis (Hallucinations)</p> <p>So it's like there's an illusion in my mind that doesn't really exist...I didn't – I still didn't understand what was wrong. I thought everybody talked to themselves – answered their own questions. Not being able to tell the difference between a real voice and a voice that's really not there, like there's not a person that this voice is attached to. It's just a voice that's constant. It's always – you always been around, so I figured you were just an imaginary friend type thing. But then it was like more than one, and then it's four, and they all sound different. They all want to do something different. And they sound like real people – what's the matter?...And there's nobody there, but you... Because to me, the voices are protectors in a way, but then at the same time, they're a danger. Because they don't always make sense.</p>