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Development of an “Impact of HIV” Instrument for HIV Survivors

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Abstract

As with cancer survivors, HIV-infected people may have unique physical, psychological, social, and existential challenges over their lifespans, yet no single instrument can assess such challenges. A newly created Impact of HIV Survey, modified from Zebrack's Impact of Cancer Scale, was developed and completed by 356 HIV-infected patients on antiretroviral therapy. Factor analyses confirmed 7 scales within 38 items: Health Awareness, Positive Self-Evaluation, Positive Outlook, Value of Relationships, Negative Self-Evaluation-Outlook, Health Anxiety, and Body Changes (Cronbach's alphas range = 0.54 – 0.93). Participants scored high on health awareness, positive outlook, and value of relationships; high on health worry; and low on body image concerns. Patients with HIV for 15 years and longer tended to have higher positive self-evaluation scores and lower negative self-evaluation-outlook scores compared to those with HIV for a shorter duration. The initial survey version had good internal validity with potential utility in research and clinical care.

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Disclosures

The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

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Keywords

chronic illness; HIV; long-term survivors; nursing; psychometrics

In 2011, an estimated 1.2 million persons in the United States were living with HIV infection (Bradley et al., 2014). The number of deaths from HIV each year has declined, primarily as a result of effective antiretroviral therapy (ART). Life expectancies for newly diagnosed persons are approaching that of uninfected populations (Zwahlen et al., 2009).

“Cancer survivor” was defined by the National Coalition for Cancer Survivorship in 1986 as a patient and his/her family who are living with cancer “from the time of diagnosis, through the balance of his or her life” (Twombly, 2004, p. 1414). Survivorship in a more general sense typically involves experiencing a life-altering event. Survivors commonly must confront their mortality while experiencing isolation and the need for support. They also typically search for meaning in their experiences, feel the need to reprioritize their lives, and feel uncertainty about their prognoses (Peck, 2008). They may adopt healthier behaviors, develop a positive outlook, and strengthen the value of their social relationships to cope with the disease (Pascal & Endacott, 2010). We reasoned that HIV-infected persons might experience the same challenges and cope with the life-altering HIV diagnosis in a similar way (Buscher & Giordano, 2010).

Ferrell and Dow’s (1997) cancer survivorship quality of life model incorporated four main domains: (a) physical wellbeing and symptoms; (b) psychological wellbeing including depression, anxiety, and fear of worsening; (c) social wellbeing including isolation; and (c) spiritual wellbeing including hope and uncertainty. Zebrack, Ganz, Bernaards, Petersen, and Abraham (2006) developed the Impact of Cancer Scale to explore the many challenges faced by cancer survivors. Their instrument has allowed researchers to assess positive and negative changes that may accompany cancer survivorship and has allowed clinicians to identify aspects of survivorship that should be enhanced in an affected individual and that require intervention.

Currently, several instruments assess multiple dimensions of life for people living with HIV (PLWH). However, most of these instruments do not include important variables such as helping others, positive health awareness, body image, spirituality, health anxiety, or concerns about the future. The WHOQOL-HIV instrument does not address helping others or positive health awareness (Duracinsky, Herrmann, et al., 2012). Body image, health anxiety, and spirituality are not addressed in the MOS-HIV survey (Wachtel et al., 1992). The PRO-QOL HIV questionnaire does not address spirituality or positive emotions, while the HAT-QOL instrument does not address body image, spirituality, or concerns about the future (Duracinsky, Lalanne, et al., 2012; Holmes & Shea, 1998). A new instrument including these dimensions as well as others could be used for clinical care as well as future HIV research. To facilitate the investigation of the long-term physical, psychological, social, and existential challenges faced by PLWH, we developed an Impact of HIV Survey modified from the Impact of Cancer Scale (Zebrack et al., 2006) in accordance with Ferrell and Dow’s model (1997). Here we report the initial psychometric evaluation and survey

results from use of an HIV-specific measure that assesses long-term aspects of living with HIV.

Methods

Study Design, Participants, and Setting

We conducted a cross-sectional study of PLWH at Thomas Street Health Center, an HIV clinic in Houston, Texas. Our study was a sub-study within the evaluation of a clinic-wide social marketing intervention to improve adherence to antiretroviral therapy (ART). The parent study included 393 participants (Giordano et al., 2013). Enrollment into the study occurred between March and September of 2010. Participants ages 18 years and older were eligible for the study if they had been prescribed ART for at least the last 30 days, spoke English or Spanish, and took their medications without assistance. The study was approved by the Institutional Review Boards of the University of Texas MD Anderson Cancer Center and Baylor College of Medicine. All participants provided written informed consent.

For each of the items in Zebrack's Impact of Cancer Scale (version 1; Zebrack et al., 2006), we changed the term "cancer" to "HIV." We then removed 24 items from the 70-item scale, as they had low content validity, such as, *I feel guilty today for not having been available to my family when I had cancer* and *Now that my treatment has ended I feel like my cancer doctors are not interested in my well-being*. The 46-item revised questionnaire was called the Impact of HIV Survey. Participants completed the interviewer-administered questionnaire while at clinic appointments.

In addition to the Impact of HIV Survey, participants reported their demographics, modes of HIV transmission, duration of HIV infection, and duration of ART use. Electronic medical records were reviewed to obtain each participant's most recent CD4+ T cell count and HIV RNA levels.

Outcome Measures and Data Analysis

For our psychometric evaluation, we first categorized items by the 10 domains originally established in Zebrack's Impact of Cancer Scale. Zebrack's scale proposed measuring two general domains: Positive Impact and Negative Impact. Within the Positive Impact general domain there were five specific domains: Health Awareness (4 items), Positive Self-Evaluation (8 items), Positive Outlook (3 items), Value of Relationships (2 items), and Meaning of Cancer (5 items). Within the Negative Impact general domain there were also five specific domains: Body Changes (5 items), Negative Self-Evaluation (4 items), Negative Outlook (4 items), Life Interferences (3 items), and Health Worry (3 items). We therefore conducted exploratory and confirmatory factor analyses using two five-factor models, one each for the Positive and Negative Impact general domain items, as a starting point to establish individual domain scale unidimensionality. In the primary phase of item identification, items with factor loadings of less than 0.50 were excluded from originally proposed domains; such items were then tested for inclusion with other domains if (a) the item content was consistent with the construct of the newly proposed domain and (b) the item intercorrelations with other items of the newly proposed domain were at least moderate

in magnitude (i.e., $r > .30$). In the secondary phase of item identification, selected items were excluded if they did not contribute positively to scale reliability. Final multi-factor Positive Impact and Negative Impact confirmatory factor analytic models were assessed for overall model fit using four goodness-of-fit statistics: (a) the Non-Normed Fit Index (NNFI; Bentler, 1990), (b) the Comparative Fit Index (CFI; Bentler, 1990), (c) the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), and (d) the Standardized Root Mean Square Residual (SRMR; Byrne, 1998). Rather than rely on a single goodness-of-fit statistic to document overall model fit, the use of a larger set of statistics allowed for a more robust determination of model fit. NNFI and CFI values more than 0.95 and RMSEA and SRMR values less than 0.08 were considered indicative of good overall model fit (Hu & Bentler, 1999).

Specific psychometric properties of finalized scales were then re-assessed. Scales were re-evaluated for thematic consistency (i.e., content validity) and statistical consistency (i.e., reliability). Internal consistency reliability was estimated using Cronbach's alpha. Derived scales were then scored by computing the mean of scale items based on the scale's Likert-type response categories, which ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores were calculated such that higher values indicated a greater impact of the HIV domain measured.

Construct validity of the Impact of HIV Survey was then evaluated, first by examining Spearman correlations between the various derived scales for anticipated (a) associations between positive Impact of HIV scales and negative Impact of HIV scales and (b) disassociations between positive and negative Impact of HIV scales. High correlations were defined as $r \geq 0.45$, and moderate correlations as $0.30 \leq r < 0.45$ (Burnand, Kernan, & Feinstein, 1990). We then assessed median scale scores based on HIV duration (0 to < 2 years, 2 to < 5 years, 5 to < 10 years, 10 to < 15 years, 15+ years) and compared global differences between scores using Kruskal-Wallis tests.

Results

Participant Characteristics

Three hundred fifty-six individuals completed the Impact of HIV Survey in English and their data were included in this analysis. The majority of the participants were male, 35–49 years of age, Black, unemployed, and had a high school diploma (Table 1).

Establishing Scales of the Impact of HIV Survey

Forty-six items from the Impact of Cancer Scale underwent factor analyses and were subjected to an item identification process that included item reduction, item re-alignment, and scale domain consolidation. The 10 originally proposed specific domains of the Impact of Cancer Scale were not all supported. Although evidence suggested the existence of two general domains, Positive and Negative Impact of HIV, only seven specific domains were supported by the data. Within the Positive Impact general domain four specific domains were confirmed: Physical: Health Awareness (6 items), Psychological: Positive Self-Evaluation (3 items), Existential: Positive Outlook (3 items), and Social: Value of

Relationships (6 items). The Meaning of HIV domain was not supported; its items were either re-aligned with other appropriate domains or excluded.

Within the Negative Impact general domain, three specific domains were confirmed: Physical: Body Changes (3 items), a combined Psychological-Existential: Negative Self-Evaluation/Negative Outlook domain (12 items), and Health Worry (5 items). The Life Interferences domain was not supported. As with the Meaning of HIV domain, its items were either re-aligned with other appropriate domains or excluded. The seven confirmatory factor analysis-derived scales consisting of a total of 38 items are summarized in Table 2.

Four scales measured the positive impact of HIV. The overall fit of the four-factor Positive Impact model to the data was good (NNFI = 0.99, CFI = 0.99, RMSEA = 0.045, SRMR = 0.055). Three scales measured the negative impact of HIV. The overall fit of the three-factor Negative Impact model to the data was also good (NNFI = 0.97, CFI = 0.98, RMSEA = 0.073, SRMR = 0.062). Score distributions for the four Positive Impact scales tended to be minimally truncated, ranging from more than 1 to 5; they also exhibited a negative skewness. Score distributions for the three Negative Impact scales showed no truncation and ranged from 1 to 5; these distributions tended to be normal. Cronbach's alphas for the Impact of HIV scales ranged from .54 to .93 with most being more than .70 (Table 3), suggesting acceptable levels of internal consistency/reliability, particularly in regard to the ability to make group comparisons.

To evaluate construct validity, we calculated Spearman's correlations for the scale scores (Table 4). We had anticipated associations between Positive Impact of HIV scales. Correlations for the Positive Impact scales were all moderate to high in magnitude and ranged from $r = .41$ to $r = .58$. No correlation for the Positive Impact scales was less than .40 (to suggest unrelatedness), nor was any correlation more than .70 (to imply domain redundancy). Likewise, we had anticipated associations between Negative Impact of HIV scales. Correlations for the Negative Impact scales were also high in magnitude and ranged from $r = .46$ to $r = .63$. As with the Positive Impact scales, no correlation for the negative Impact scales was less than .40 (to suggest unrelatedness), nor was any correlation more than .70 (to imply domain redundancy). Finally, we had anticipated disassociations or low-level associations between Positive and Negative Impact of HIV scales. Correlations between the Positive and Negative Impact scales were all slight or small in magnitude, ranging from $r = .01$ to $r = .22$. No correlation between the Positive and Negative Impact scales was more than .30 (to suggest possible relatedness).

Scores on the Positive Impact scales displayed little or no floor effects (0% – 2% of scores at floor value = 1); however, some ceiling effects were observed with the Positive Self-Evaluation scale (39% at ceiling value = 5); the remaining three Positive Impact scales all had a percentage of scores at ceiling value less than or equal to 20% (range: 14% – 20%). Scores on the Negative Impact scales displayed minimal floor effects (2% – 7% at floor value = 1) and minimal ceiling effects (1% – 10% at ceiling value = 5).

Scale Scores

The median scale scores ranged from 2.64 to 4.33 (Table 5). When stratified by years since HIV diagnosis, participants with an HIV duration of more than 15 years tended to have lower Negative Self-Evaluation-Outlook scores ($p = .07$ for global differences) and somewhat higher positive self-evaluation scores compared to other participants ($p = .13$ for global differences).

Discussion

In this study of 356 HIV-infected persons, we report the initial psychometric evaluation of a new instrument that addresses the long-term physical, psychological, social, and existential challenges faced by many PLWH. Factor analyses of items confirmed seven scales (totaling 38 items) with all scales exhibiting acceptable or better reliability, even in most demographic subgroups. As anticipated, we also found moderate-to-high-level correlations between Positive Impact scales and between Negative Impact scales, and low-level correlations between Positive and Negative Impact scales.

Regardless of HIV duration, participants had relatively high scores (range = 4.00 – 4.83) on the Physical: Health Awareness scale, which reflected a heightened awareness of personal health. These scores were higher than were found in the original Impact of Cancer Scale study (mean 3.79 [SD 0.76]; Zebrack et al., 2006), and in breast cancer survivors (mean 3.80 [SD 0.65]; Crespi, Ganz, Petersen, Castillo, & Cann, 2008).

Participants with HIV diagnosis duration of more than 15 years had somewhat higher scores on the Psychological: Positive Self-Evaluation scale (including hopefulness and pride) compared to participants with a shorter duration of disease, although the trend was not significant ($p = 0.13$). While hopefulness has been assessed in cancer survivors (Blank & Bellizzi, 2006; Sarna et al., 2002), no studies have examined hopefulness by survival time. Our study results may indicate that individuals with a longer HIV duration feel more pride in surviving with HIV and have more feelings of hope. Participants in our study with HIV for 15 or more years would have lived through the transition from ineffective to effective ART. Still living with HIV may have given them an increased sense of pride.

Regardless of HIV duration, participants had relatively high scores on the Existential: Positive Outlook scale, which meant that they all had similar levels of confidence and feelings of direction in life. In a qualitative study of leukemia survivors 3-to-15 years after diagnosis, several participants noted having an increased confidence that came from surviving leukemia (McGrath, 2004). Similarly, a group of head and neck cancer survivors stated that they had experienced an increase in self-confidence from having cancer (Thambyrajah, Herold, Altman, & Llewellyn, 2010). It is possible that simply having a diagnosis of cancer or HIV might engender confidence early to cope with the disease, as opposed to hope and pride, which appeared to increase later in time.

The high scores we observed on the Social: Value of Relationships scale reflected a high priority on social networks and a willingness to help others. Several studies have shown that African American cancer survivors use “helping others” as a coping strategy, as it resulted

in feelings of being connected to friends and family (Agarwal, Hamilton, Crandell, & Moore, 2010; Hamilton, Stewart, Crandell, & Lynn, 2009). Greater understanding of HIV survivor feelings of social connectedness is needed, as this may affect quality of life and, perhaps, clinical outcomes for PLWH.

Study participants with an HIV duration of more than 15 years tended to have lower scores on the Psychological-Existential: Negative Self-Evaluation-Outlook scale compared to participants with a shorter duration of disease ($p = 0.07$), suggesting that it might take years for PLWH to have fewer worries about the future, have less anger about having the disease, and develop a more positive meaning of HIV. Breast cancer survivors 5 years post-diagnosis had fewer fears about the future compared to shortly after diagnosis (Bloom, Stewart, Chang, & Banks, 2004). Anger also declined with survival in head and neck cancer survivors (Rapoport, Kreidler, Chaitchik, Algor, & Weissler, 1993). For some cancer survivors, living through cancer gave life meaning and perspective, but this phenomenon might also take time to develop (Pascal & Endacott, 2010; Sherman, Simonton, Latif, & Bracy, 2010). In colorectal cancer survivors, higher meaning of illness was significantly associated with better health-related quality of life (Salsman, Yost, West, & Cella, 2011). Cognitive behavioral methods to ease worries about the future, deal with anger, and enhance meaning-making in early HIV survivors may help them better adjust psychologically to the disease (Kraaij et al., 2008).

Health Worry scale scores in our study were high. Grassi et al. (1999) found that asymptomatic HIV-infected persons had more health worry than persons in studies for cancer and other medical illnesses. Survivors of childhood cancer have reported health worries many years after the cancer diagnosis (Zebrack & Chesler, 2001). Cancer survivors worry about the possibility of recurrence, and health worry in cancer survivors has been associated with depression, anxiety disorders, and decreased quality of life (Deimling, Bowman, Sterns, Wagner, & Kahana, 2006; Van den Beuken-van Everdingen et al., 2008). Further research into health worry and its impact on PLWH is warranted, and some HIV survivors may benefit from targeted psychosocial interventions.

Our participants had somewhat low scores on the Physical: Body Changes scale regardless of HIV duration, indicating low awareness of body changes, in contrast to studies conducted in HIV-infected populations with larger proportions of men who have sex with men (Huang et al., 2006; Kelly, Langdon, & Serpell, 2009). Similar to our findings, HIV duration and disease progression were not associated with higher body image scores (Martinez, Kemper, Diamond, & Wagner, 2005). Studies of body image issues in testicular cancer survivors have found equivocal results (Carpentier & Fortenberry, 2010), and body image in breast cancer survivors differed very little from that of controls (Dahl, Reinertsen, Nesvold, Fossa, & Dahl, 2010).

The Impact of HIV Survey measures physical, psychological, social, and existential challenges faced by PLWH, all of which may affect quality of life as well as adherence and retention in care. Our instrument allows for further description of HIV survivors and a more complete assessment of the challenges facing those patients, especially as they age with HIV infection. Because our survey consists of only 38 items, care providers could use it in real

time patient care and research to identify specific challenges for individual patients that need to be addressed. Once the specific challenges affecting survivor adherence and retention in care are identified, interventions could be developed that address such challenges.

Our study had several limitations. We do not know if important domains are missing in the existing survey, such as a scale measuring HIV stigma. The survey has not undergone stringent external validation. We did not have enough Spanish language participants to validate a Spanish version of the Impact of HIV Survey. We also had few White participants, women, and participants who were men who had sex with men, potentially limiting generalizability.

Conclusion

The Impact of HIV instrument addresses the long-term physical, psychological, social, and existential challenges faced by many HIV-infected persons living with the disease. Although our instrument requires additional study to ensure that it is comprehensive, externally valid, and properly translated and validated in Spanish, the current English version has been found to be internally valid. Further development of the survey is justified.

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Key Considerations

- The Impact of HIV Survey measures physical, psychological, social, and existential challenges faced by HIV-infected persons, all of which may affect quality of life as well as adherence and retention in care, especially as patients age with HIV.
- This instrument will allow researchers to assess the positive and negative changes that may accompany HIV survivorship, and may allow nurses and other clinicians to provide specific care appropriate to the unique needs of the patient.
- HIV-infected patients on antiretroviral therapy report high health worry, which may need clinical attention.

Table 1

Characteristics of 356 Participants Completing the Impact of HIV Survey

Characteristic	N (%)
Gender*	
Male	223 (64.1)
Female	125 (35.9)
Age*	
< 35 years of age	42 (12.0)
35–49 years of age	185 (52.9)
50 years of age	123 (35.1)
Race/Ethnicity*	
Black, non-Hispanic	286 (81.5)
White, non-Hispanic	30 (8.5)
Hispanic	35 (10.0)
Education*	
No diploma, never finished high school	110 (30.9)
High school diploma	175 (49.2)
GED	71 (19.9)
Work Status	
Employed	36 (10.1)
Unemployed	319 (89.9)
Modes of HIV Transmission	
History of IV drug use	80 (22.5)
MSM	104 (29.3)
Heterosexual/Other	171 (48.2)
Duration of HIV Infection*	
0 to < 2 years	30 (8.5)
2 to < 5 years	56 (15.9)
5 to < 10 years	76 (21.5)
10 to < 15 years	81 (22.9)
15+ years	110 (31.2)
Years on ART*	
0 to < 2 years	46 (13.0)
2 to < 5 years	67 (19.0)
5 to < 10 years	85 (24.1)
10 to < 15 years	78 (22.1)
15+ years	77 (21.8)
CD4+ T cell count at the time of survey	
< 200 cells/mm ³	58 (20.1)
200–350 cells/mm ³	63 (21.9)
> 350 cells/mm ³	167 (58.0)

Characteristic	N (%)
HIV viral load at the time of survey	
< 400 copies/mL	207 (71.9)
400 copies/mL	81 (28.1)

Note: GED = general equivalency diploma; MSM = men who have sex with men; ART = antiretroviral therapy;

* missing data.

Table 2

Seven Factor-Derived Scales Consisting of 38 items on Subjects (N = 356) and Descriptive Statistics of All 7 Scales

Scales and Items	Item	Scale		
	Source [*]	Factor Loading	Median [†]	Min-Max
Positive				
Physical: Health Awareness ($\alpha = 0.75$)			4.33	2.00–5.00
Time is precious	Life Outlook	.69		
Do not take body for granted	Your Body/Health	.69		
More concerned about health	Your Body/Health	.80		
More aware of physical problems	Your Body/Health	.64		
Take better care of myself	Your Body/Health	.76		
Reason to make changes in life	Meaning of HIV	.73		
Psychological: Positive Self-Evaluation ($\alpha = 0.76$)			4.33	1.67–5.00
Consider myself an HIV survivor	Feelings about HIV	.74		
Pride from surviving HIV	Feelings about HIV	.83		
Learned something about myself	Feelings about HIV	.88		
Existential: Positive Outlook ($\alpha = 0.85$)			4.00	1.00–5.00
Better about expressing what I want	Meaning of HIV	.82		
More confidence	Meaning of HIV	.86		
Direction in life	Meaning of HIV	.93		
Social: Value of Relationships ($\alpha = 0.81$)			4.17	1.33–5.00
Strengthened religious faith	Life Outlook	.74		
Higher value on relationships	Activities and Relationships	.58		
Special bond with people with HIV	Activities and Relationships	.74		
More understanding	Activities and Relationships	.75		
More willing to help others	Activities and Relationships	.85		
Feel should give something back	Activities and Relationships	.81		
Negative				
Psychological-Existential: Negative Self-Evaluation-Outlook ($\alpha = 0.89$)			2.64	1.00–5.00
Unsure about future	Life Outlook	.74		
Worry about future	Life Outlook	.74		
Afraid to die	Life Outlook	.58		
Feel like time is running out	Life Outlook	.72		
Angry about having HIV	Feelings about HIV	.73		
Feel guilty for getting HIV	Feelings about HIV	.61		
Feel old	Feelings about HIV	.66		
Feel like HIV runs my life	Meaning of HIV	.68		
Feel alone	Activities and Relationships	.74		
Feel like some people do not understand me	Activities and Relationships	.66		
Keeps me from doing activities I enjoy	Activities and Relationships	.75		
Symptoms interfere with life	Activities and Relationships	.78		

Scales and Items	Item	Scale		
	Source [*]	Factor Loading	Median [†]	Min-Max
Health Worry ($\alpha = 0.83$)			3.60	1.00–5.00
Worry about health	Your Body/Health	.69		
Worry about not keeping HIV under good control	Your Body/Health	.69		
New symptoms make me worry HIV is not under control	Your Body/Health	.76		
Concerned that energy has not returned	Your Body/Health	.85		
Bothered that body cannot do what it could before	Your Body/Health	.86		
Physical: Body Changes ($\alpha = 0.77$)			2.67	1.00–5.00
Worry about how my body looks	Your Body/Health	.79		
Feel disfigured	Your Body/Health	.86		
Sometimes wear clothing to cover up	Your Body/Health	.75		

Note.

^{*} Category in which the item appeared in the Impact of HIV Survey;

[†] Median responses derived from the following response categories: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.

Table 3

Cronbach’s Alphas for the Impact of HIV Survey by Participant Characteristics

Characteristic	Cronbach's alphas							
	Entire Survey	Physical: Health Awareness	Psychological: Positive Self-Evaluation	Existential: Positive Outlook	Social: Value of Relationships	Psychological-Existential: Negative Self-Evaluation	Health Worry	Physical: Body Changes
Gender								
Male	0.91	0.78	0.76	0.84	0.82	0.89	0.85	0.75
Female		0.66	0.78	0.88	0.76	0.91	0.80	0.80
Years of Age								
< 35	0.81	0.78	0.76	0.87	0.84	0.86	0.86	0.74
35-49	0.90	0.75	0.77	0.83	0.84	0.90	0.81	0.79
50 and older	0.90	0.72	0.77	0.89	0.72	0.90	0.84	0.74
Race/Ethnicity								
Black, non-Hispanic	0.90	0.76	0.78	0.85	0.80	0.90	0.83	0.77
White, non-Hispanic	0.90	0.82	0.74	0.90	0.86	0.85	0.84	0.75
Hispanic	0.88	0.55	0.70	0.79	0.80	0.89	0.83	0.78
Education								
No diploma - never finished high school	0.92	0.83	0.77	0.80	0.84	0.89	0.80	0.70
High school diploma	0.88	0.67	0.73	0.85	0.78	0.90	0.83	0.76
GED	0.88	0.71	0.82	0.91	0.82	0.89	0.85	0.88
Work Status								
Employed	0.88	0.55	0.83	0.92	0.79	0.90	0.84	0.70
Unemployed	0.89	0.76	0.76	0.84	0.81	0.89	0.82	0.78
Modes of HIV Transmission								
History, IV drug use	0.89	0.74	0.74	0.88	0.82	0.89	0.84	0.79
MSM	0.88	0.64	0.72	0.81	0.78	0.89	0.81	0.76
Heterosexual/Other	0.89	0.79	0.80	0.86	0.82	0.90	0.83	0.77
Duration of Infection								
0 to < 2 years	0.91	0.85	0.86	0.87	0.92	0.93	0.83	0.77
2 to < 5 years	0.87	0.82	0.73	0.85	0.76	0.91	0.86	0.83

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Characteristic	Cronbach's alphas							
	Entire Survey	Physical: Health Awareness	Psychological: Positive Self-Evaluation	Existential: Positive Outlook	Social: Value of Relationships	Psychological-Existential: Negative Self-Evaluation	Health Worry	Physical: Body Changes
5 to < 10 years	0.91	0.79	0.62	0.84	0.82	0.87	0.83	0.71
10 to < 15 years	0.90	0.69	0.77	0.83	0.83	0.90	0.84	0.79
15+ years	0.87	0.66	0.81	0.88	0.73	0.87	0.78	0.75
Years on ART								
0 to < 2 years	0.90	0.68	0.74	0.88	0.87	0.91	0.84	0.84
2 to < 5 years	0.89	0.88	0.78	0.81	0.84	0.91	0.83	0.75
5 to < 10 years	0.90	0.79	0.69	0.85	0.80	0.86	0.83	0.70
10 to < 15 years	0.89	0.69	0.81	0.88	0.79	0.90	0.83	0.78
15+ years	0.86	0.54	0.78	0.83	0.73	0.88	0.80	0.79
CD4+ T cell count at the time of survey								
< 200 cells/mm ³	0.89	0.70	0.76	0.88	0.78	0.90	0.78	0.71
200–350 cells/mm ³	0.87	0.61	0.76	0.90	0.82	0.89	0.80	0.76
> 350 cells/mm ³	0.91	0.81	0.75	0.78	0.81	0.91	0.84	0.80
HIV viral load at time of survey								
< 400 copies/mL	0.90	0.76	0.72	0.84	0.79	0.91	0.82	0.80
400 copies/mL	0.89	0.74	0.82	0.85	0.86	0.89	0.83	0.71

Note: GED = general equivalency diploma; MSM = men who have sex with men; ART = antiretroviral therapy.

Table 4

Scale Correlation (Spearman's rho) Matrix for the Impact of HIV Survey

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Physical: Health Awareness (+)	1.00						
(2) Psychological: Positive Self-Evaluation (+)	0.49	1.00					
(3) Existential: Positive Outlook (+)	<i>0.41</i>	0.46	1.00				
(4) Social: Value of Relationships (+)	0.58	0.56	0.56	1.00			
(5) Psychological-Existential: Negative Self-Evaluation-Outlook (–)	0.01	–0.20	–0.15	–0.14	1.00		
(6) Health Worry (–)	0.22	0.05	0.10	0.16	0.63	1.00	
(7) Physical: Body Changes (–)	0.04	–0.09	–0.08	–0.02	0.57	0.46	1.00

Note: Bold figures represent high correlations (> 0.45) and italicized figures represent moderate correlations ($0.30 < r < 0.45$); +, ++ = positive impact scale; –, -- = negative impact scale.

Table 5

Impact of HIV Scale Scores Overall and by HIV Duration

	HIV Duration: Median (25 th , 75 th Percentile)						p value
	All participants	0 to < 2 years n = 30	2 to < 5 years n = 56	5 to < 10 years n = 76	10 to < 15 years n = 81	15+ years n = 110	
(1) Physical: Health Awareness	4.33 (4.00, 4.83)	4.58 (4.00, 5.00)	4.58 (4.00, 4.83)	4.33 (4.00, 4.79)	4.33 (4.00, 4.83)	4.33 (4.00, 4.83)	0.21
(2) Psychological: Positive Self-Evaluation	4.33 (4.00, 5.00)	4.33 (4.00, 5.00)	4.50 (4.00, 5.00)	4.33 (4.00, 4.67)	4.33 (4.00, 5.00)	4.67 (4.00, 5.00)	0.13
(3) Existential: Positive Outlook	4.00 (3.33, 4.67)	4.00 (3.25, 5.00)	4.00 (3.33, 4.67)	4.00 (3.33, 4.00)	4.00 (3.00, 4.83)	4.00 (3.33, 4.67)	0.83
(4) Social: Value of Relationships	4.17 (3.67, 4.67)	4.33 (3.62, 5.00)	4.17 (3.71, 4.67)	4.00 (3.50, 4.50)	4.17 (3.67, 4.83)	4.00 (3.67, 4.50)	0.44
(5) Psychological-Existential: Negative Self-Evaluation-Outlook	2.64 (2.08, 3.33)	2.71 (2.25, 4.12)	2.62 (2.02, 3.40)	2.67 (2.17, 3.23)	2.75 (2.33, 3.50)	2.42 (2.00, 3.02)	0.07
(6) Health Worry	3.60 (2.80, 4.20)	3.90 (2.60, 4.65)	3.80 (2.80, 4.40)	3.60 (2.80, 4.00)	3.60 (2.80, 4.40)	3.40 (2.80, 4.00)	0.17
(7) Physical: Body Changes	2.67 (2.00, 3.67)	2.67 (2.25, 4.00)	2.67 (2.00, 3.83)	2.67 (2.00, 3.33)	2.67 (2.00, 3.83)	2.67 (2.00, 3.33)	0.62

Note: Median responses derived from the following response categories: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.