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Assessing Appearance-Related Disturbances in HIV-Infected Men Who have Sex with Men (MSM): Psychometrics of the Body Change and Distress Questionnaire—Short Form (ABCD-SF)

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Abstract

Appearance-related disturbances are common among HIV-infected MSM; however, to date, there have been limited options in the valid assessment of this construct. The aim of the current study was to assess the structural, internal, and convergent validity of the assessment of body change distress questionnaire (ABCD) and its short version. Exploratory and confirmatory factor analyses indicated that both versions fit the data well. Four sub-factors were revealed measuring the following body disturbance constructs: (1) negative affect about appearance, (2) HIV health-related outcomes and stigma, (3) eating and exercise confusion, and (4) ART non-adherence. The subfactors and total scores revealed bivariate associations with salient health outcomes, including depressive symptoms, HIV sexual transmission risk behaviors, and ART non-adherence. The ABCD and its short form, offer valid means to assess varied aspects of body image disturbance among HIV-infected MSM, and require modest participant burden.

Keywords

HIV; MSM; Body image disturbance; Scale development; Health outcomes

Introduction

Men who have sex with men (MSM) comprise the largest number of individuals living with HIV in the United States [1]. Lipodystrophy, is a condition defined by lipoatrophy of the face, limbs, and/or buttocks, and/or lipohypertrophy of the neck, chest and/or abdomen [2]. These morphological changes may occur as a result of prolonged use of anti-retroviral therapy (ART) and/or a function of HIV disease progression, and is still a significant condition among HIV-infected individuals [3–5]. Prevalence estimates vary widely, with some studies reporting that up to 60 % of HIV-infected individuals experience moderate to severe changes in body fat composition that could be classified as lipodystrophy [4, 5]. Lipodystrophy has been associated with a number of adverse behavioral and psychosocial health outcomes, including ART nonadherence [6–8], poor quality of life [9, 10], depression [11–13] and body dissatisfaction [14, 15].

Body dissatisfaction among HIV-infected individuals has garnered increased attention over recent years [16], as it has been associated with important health outcomes, such as poor ART adherence [3, 17], increased sexual behaviors that can transmit HIV [18], elevated levels of depressive symptoms [3, 17, 19, 20] increased methamphetamine use [21], and low self-esteem [22]. MSM, regardless of their HIV status, are more likely to experience high levels of body dissatisfaction compared to their heterosexual counterparts [23, 24], and lipodystrophy may exacerbate already elevated levels of body dissatisfaction. Given the negative HIV health outcomes that lipodystrophy may enhance, both independently and as a result of heightened body dissatisfaction, valid measures to assess bodily changes and associated perceptions among HIV-infected MSM are needed.

The assessment of body change distress (ABCD) questionnaire [25, 26] is one scale that has been developed for assessing the psychosocial impact of body changes in HIV-infected individuals. The ABCD was developed by the Adult AIDS Clinical Trials Group (AACTG) of the US National Institute of Allergy and Infectious Diseases (NI-AID), and it has been successfully translated into an Italian version [4]. The ABCD assesses subjective report of bodily changes and body dissatisfaction, and it includes 20 items on the impact of bodily changes on psychosocial variables, quality of life, and HIV self-care behaviors. It has been used as a measure of body image satisfaction in studies on the effectiveness of biomedical interventions for lipodystrophy [27–29]. It has also been used to demonstrate associations between body dissatisfaction, lipodystrophy severity, and a number of health outcomes, including sexual functioning [4, 30], health-related quality of life [31], general mental health [4], HIV symptom severity, and depressive symptoms [32]. While to our knowledge, no studies have used the ABCD as a predictor of ART non-adherence among HIV patients experiencing lipodystrophy or body dissatisfaction, it has been recommended for this purpose [33].

Despite the wide use of the ABCD, to date, there is a paucity of research examining its psychometric properties. Guaraldi and colleagues [4] are among the only researchers to examine the validity of the ABCD. In their study, the scale was found to be internal consistent with a Cronbach's α of 0.94 for the 20 items assessing the psychosocial consequences of body changes. The scale was also found to have strong convergent validity with general mental health variables [4]. However, the structural validity of the ABCD has yet to be examined. While some [34] have suggested the use of a composite score for the ABCD, it is possible that a factor analysis would yield subscales that would allow for a more specific assessment of the impact of body dissatisfaction on salient aspects of psychological and behavioral health for HIV-infected MSM.

The current study sought to contribute to the literature in several ways via exploring the psychometric properties of this measure. First, exploratory and confirmatory factor analyses were conducted in order to determine the underlying structure among the items of the ABCD. We also assessed the suitability of a shortened version of the questionnaire. Secondly, the internal consistency and convergent validity of the emergent factors were measured. Convergent validity was assessed by measuring bivariate correlations between ABCD factors with established measures of body image, and then we examined the potential utility of the measure by examining the associations of factors to several HIV health outcomes (i.e., depressive symptoms, HIV sexual transmission risk behaviors, and ART adherence).

Methods

Participants and Procedures

Participants were 106 HIV-infected MSM recruited from the infectious disease clinic at Massachusetts General Hospital and Fenway Health—a community health center in Boston, MA serving the gay, lesbian, bisexual, and transgender community. Flyers advertised the study as a project examining body image, depression and self-care behaviors in HIV-infected MSM. Inclusion criteria for the study included: (1) HIV-infected, (2) engaged in anal sex (protected or unprotected) with men in the previous 12 months, (3) male gender, and (4) prescribed ART for the past 2 months or longer. Initially, 124 potential participants were screened (18 individuals failed to meet inclusion criteria for the study). Participants completed electronic questionnaires via REDCap, a software toolset and workflow methodology for electronic collection and management of research and clinical trial data, in a private area at Massachusetts General Hospital or Fenway Health.

Measures

Body Image—Participants completed the ABCD questionnaire to assess distress and impairment related to changes in body morphology. The ABCD includes an initial section that assesses self-reported presence of and severity of lipoatrophy and lipohypertrophy with six items, along with 20 items that assess distress and psychosocial impairment related to body disturbance. To assess the prevalence of lipodystrophy, lipohypertrophy, and lipoatrophy, three dichotomous variables were created, reflecting endorsement of one or more respective symptoms vs. none. On the distress and impairment items, participants

responded to items with a five-point response scale ranging from 1 “none of the time” to 5 “all the time”, over the previous 4 weeks. Higher scores indicate increased body image disturbance and for the current sample internal consistency was $\alpha = .93$.

Participants also completed the Body Areas Satisfaction Scale (BASS) and the Appearance Evaluation (AE) sub-scale of the Multidimensional Body-Self Relations Questionnaire (MBSRQ; [35]). Participants responded to the 7-item AE subscale with options ranging from 1 “definitely disagree” to 5 “definitely agree”, and to the 9-item BASS with options ranging from 1 “very dissatisfied” to 5 “very satisfied.” Higher scores on the AE and BASS denote increased body satisfaction. Internal consistency from the current sample for the BASS and AE were both $\alpha = .88$.

The Revised Male Body Attitudes Scale [36] was also completed. The MBAS-R assesses participants’ attitudes toward their muscularity, body fat, and height with 15-items, responded to via a six point scale ranging from 1 “never” to 6 “always.” Higher scores reflect more negative body attitudes. For the current sample, internal consistency was $\alpha = .88$.

Body Mass Index—Trained research assistants measured participants’ height and weight during their study visit. Height was assessed via use of a stadiometer, while weight was measured with an electronic scale. For purposes of describing the sample, these data were then used to calculate body mass index with the following formula: (weight in pounds/ (height in inches $\times$ height in inches)) $\times$ 703. The National Institutes of Health [37] utilizes the following scores to interpret BMI: BMI 18.5–24.9 (normal weight), BMI 25–29.9 (overweight), and BMI >30 (obese).

Depressive Symptoms—Participants completed the Center for Epidemiological Studies Depression scale (CES-D; [38]), a self-report measure of depressive symptoms. The CES-D assesses depressed mood in the previous week on a four point scale ranging from 0 “rarely or none of the time (less than 1 day)” to 3 “most or all of the time (5–7 days).” Higher score denote increased depressive symptoms and for the current study internal consistency was $\alpha = .93$.

ART Adherence—Adherence to ART was measured with the following item: “Thinking about the past 4 weeks, on average how would you rate your ability to take all your HIV antiretroviral medications as your doctor prescribed?” Response options ranged from 1 “very poor” to 6 “excellent.” Recent studies have demonstrated the validity of this item [39], and the validity of its use within routine clinical care for patients with HIV has also been reported [40].

HIV Sexual Transmission Risk Behavior—HIV sexual transmission risk behavior was assessed via standard sexual risk behavior questions. Over the previous 3 months, participants were asked about the number of times they had unprotected and protected insertive and receptive anal sex with male partners, and vaginal sex with female partners. These questions were assessed separately for HIV seropositive, seronegative, and partners of unknown HIV status. Sero-discordant unprotected anal intercourse (SDUAI) was defined as

any insertive or receptive anal intercourse with a HIV-uninfected or unknown status male partner in the previous 3 months.

Statistical Analyses

An initial exploratory factor analysis (EFA) was conducted on the full 20-item version of the ABCD to assess its factor structure. Principal components analysis extraction with Oblimin (with Kaiser normalization) rotation was utilized to account for correlated factors. Factors with an eigenvalue of one or greater (consistent with inspection of the scree plot) were interpreted. Individual items were interpreted if factor loadings were .50 or greater [41]. Although EFA has traditionally been viewed as a large sample technique, recent simulation studies have indicated that samples with less than 50 participants can produce reliable results [42, 43]. Indeed, the relationship between reliable EFA and sample size is likely influenced by factor loadings, number of factors, and the number of variables. Given that from the initial EFA, the average communality was .71, with five factors and 20 items, it would be expected that adequate sample size could be achieved with as little as 23–78 participants [43]. Further, the Kaiser–Meyer–Olkin (KMO) statistic tests the adequacy of the sample size, with values between .8 and .9 considered “great” [44].

To create a short form of the ABCD, the factor loadings from the long form were examined. Items within a given factor which had the highest loadings were selected for inclusion in the short form. Given that many of the items loaded highly, the content of items were reviewed by the study authors, and items which were deemed to overlap in regard to the construct measured were evaluated, with only one item selected to represent a given construct. For example, the items assessing embarrassment with appearance and dissatisfaction with appearance overlap in that they both tap a general negative evaluation of appearance, thus, only one of these items would theoretically be included in the short form.

To further assess the structural validity of both the ABCD full scale and short form, Bayesian confirmatory factor analyses were conducted. Traditional (Maximum Likelihood) CFA approaches typically require large samples [45, 46]; however, recent research has identified Bayesian approaches to structural equation modeling to be a particularly attractive option when sample size is small [47]. Unlike traditional forms of CFA, Bayesian methods do not produce the same array of standard fit indices. Rather, overall model fit is interpreted via the posterior predictive (PP) *p* value. This metric is bounded between 0 and 1, and values closer to .50 demonstrate strong fit [48]. For a detailed overview of Bayesian approaches to factor analysis and structural equation modeling see Muthén and Asparouhov [49].

Results

Sample Characteristics

Participants were 106 HIV-infected MSM, with an average age of 47.5 (SD = 7.8). The sample was primarily White (73 %) and well-educated (76 % with some college or higher). On average, the sample had been living with HIV for over 13 years (SD = 8.2), and had been taking HIV medication for roughly 10 years (SD = 6.8), and the average BMI fell within the overweight category ($M = 27$, $SD = 4.6$). The majority of the sample reported lipodystrophy

(76 %), with 59 % reporting lipohypertrophy, and 54 % reporting lipoatrophy. See Table 1 for more details.

Exploratory Factor Analysis

Initial results from the principal components analysis revealed five factors with eigenvalues greater than one, which explained roughly 70 % of the variance. The KMO statistic = .86, verifying the adequacy of the sample size used in this analysis, as values between .80 and .90 are considered “great.” After inspecting the pattern matrix, the fifth factor included two items with loadings over .5, with one of the items (control body) cross-loading on factor one with a loading of .46. Given this significant cross-loading, the fifth factor would contain only one item (money clothes), and would represent an unstable factor, thus, it was dropped from the analyses, resulting in four factors accounting for 65 % of the variance (see Table 2).

Ten items (dislike, unattractive, lonely, avoid sex, embarrassed, depressed, avoid people, low confidence, frustrated clothes, and discomfort) loaded on factor one. Generally, these items reflect negative affective experiences related to body changes. Internal consistency for this factor, identified as *Negative Affect about Appearance*, was $\alpha = .93$. Four items (sick stigma, HIV stigma, HIV progression, and dying) loaded on factor two. These items reflect stigma and fear of negative HIV health outcomes, and hence factor two was identified as *HIV Health-related Outcomes/Stigma*. Internal consistency for this factor was $\alpha = .78$. Factor three included two items (exercise confusion and eating confusion), thus, this factor was identified as *Exercise/Eating*. Internal consistency for this factor was $\alpha = .83$. Two items loaded on factor four (changing ART and ART non-adherence) and was identified as *ART*, with internal consistency of $\alpha = .62$. Internal consistency for the 18-item total score was $\alpha = .92$.

Confirmatory Factor Analyses

Results from a Bayesian CFA modeling the four factors in addition to a higher-order total score revealed the data fit the model well (posterior predictive (PP) p -value = .50). All item-level and subscale-level parameter estimates significantly loaded on their respective factors (see Fig. 1). To assess the structural validity of the ABCD-SF, a supplemental Bayesian CFA was conducted, modeling the four factors in addition to a higher-order total score. The ABCD-SF was derived from examining the factor loadings from the long form, and including items which did not overlap in content. Consequently, the short form included 10 items (four from *Negative Affect about Appearance*, two from *HIV Health-related Outcomes/Stigma*, two from *Exercise/Eating*, and two from *ART*). Here too the data fit the model well (posterior predictive (PP) p -value = .50). All item-level and subscale-level parameter estimates significantly loaded on their respective factors (see Fig. 2). Internal consistency estimates for the ABCD-SF were: *Total* $\alpha = .84$; *Negative Affect about Appearance* $\alpha = .88$; *HIV Health-related Outcomes/Stigma* $\alpha = .75$; *Exercise/Eating* $\alpha = .83$; and *ART* $\alpha = .62$.

Convergent Validity

To assess the convergent validity of the ABCD-SF, each subscale and total score was correlated with established measures of body dissatisfaction—the BASS and AE sub-scales from the MBSRQ and the total score from the MBAS-R. Generally, the ABCD-SF total and subscale scores were significantly associated with measures of body dissatisfaction (see Table 3 for intercorrelations).

To assess the bivariate relationships between the ABCD-SF and relevant health variables, the total and subscale scores of the ABCD-SF were entered into a correlation matrix with depression, ART adherence, and SDUAI (see Table 4 for intercorrelations). Each ABCD-SF subscale and total score revealed significant bivariate positive associations with depression. Two of the four ABCD-SF subscales (i.e., *ART* and *HIV Health-related Outcomes/Stigma*) revealed significant bivariate positive relationships with SDUAI. Lastly, both the *ART* and ABCD-SF total score revealed significant bivariate negative associations with ART adherence. However, a supplemental partial correlational analysis revealed that when controlling for the *ART* subscale items, the relationship between the total score and ART non-adherence was non-significant.

Discussion

Exploratory and confirmatory factor analyses of the ABCD and its short form revealed that an 18-item, as well as the 10-item short form demonstrated strong structural validity. Specifically, four subscales (i.e., *Negative Affect about Appearance*, *HIV Health-related Outcomes/Stigma*, *Eating/Exercise*, and *ART*) along with a higher-order total score were revealed to fit the data well. Thus, the total score of the ABCD-SF may be used as a valid global indicator of body image disturbance, whereas the four individual subscores may also be used to form a more nuanced assessment of salient domains of body image disturbance among HIV-infected MSM.

With respect to convergent validity, the ABCD-SF and its subscales also revealed significant relationships with salient HIV health variables. For instance, all subscales and the total score of the ABCD-SF were significantly positively associated with elevated depression. These findings correspond to previous findings in the field [3, 17, 50], and suggest that multiple components of body image disturbance are associated with elevated depressive symptoms.

With respect to the association of different components of body image disturbance and ART adherence, a conceptually logical pattern of associations also emerged. The *ART* subscale and the total short form score had a significant positive association with ART non-adherence. This follows, as individuals who are concerned about morphological changes due to ART may be less likely to be adherent to their HIV medications [3, 16, 17]. The significant association between the total score and ART non-adherence may have been influenced by the *ART* items that are included in the calculation of the total score. Indeed, when the *ART* subscale items were controlled for, the relationship between the total score and ART non-adherence was non-significant. This suggests, not surprisingly, that the most salient components of body disturbance as it relates to ART non-adherence are concerns

about morphological changes to the body as a result of ART medication, and highlights the importance of examining subdomains of body disturbance among HIV-infected MSM.

The *ART* and *HIV Health-related Outcomes/Stigma* sub-scales were significantly positively related to increased sero-discordant unprotected anal intercourse (SDUAI). Regarding the association between *ART* and SDUAI, it is possible that men who report non-adherence to ART due to body disturbance, generally have poor HIV-related self-care behaviors, in that they also place themselves (and others) at risk for sexually transmitted infections. The relationship between HIV health-related outcomes/stigma and SDUAI is less clear. Men who report HIV stigma may be concerned about rejection which could result from condom use negotiations, as these conversations can lead to disclosure of one's serostatus. However, other possible explanations may be the influence of unaccounted for third variables. Thus, future research is needed to more fully understand this connection.

The results from the current study have the potential to inform clinical research and practice. Most notably, given that we have created and validated a shortened version of the ABCD, this may increase its use both in clinical practice and in research settings. With only 10 items, the ABCD-SF represents a relatively modest burden on participants and yields a total score, along with four subscales. As revealed in the bivariate analyses, the various subscales produce different patterns of associations to depression, ART adherence, and HIV sexual transmission risk behaviors. Thus, clinicians and researchers alike can gain valuable data around various aspects of appearance-related distress, versus appearance related distress more generally and how they relate to salient health outcomes; this can inform what aspects of treatment need to be addressed with particular patients. For instance, if a patient reports an elevated score on the *ART* subscale, clinicians may wish to specifically focus on the interplay between ART adherence and concerns regarding morphological changes of the body. Alternatively, patients with elevated scores on *Eating/Exercise* may require psychoeducation on these topics as they relate to HIV, or perhaps even referrals for adjunctive nutritional counseling.

There are several limitations that should be highlighted. First, although the current study possessed adequate power for the analyses undertaken, the factor structure should be cross-validated in additional samples. Ideally this would also include participants of various sexual orientations and sex, as the results of the current study are only generalizable to primarily White HIV-infected MSM. Also, there continues to be a lack of empirical data on the mechanisms that drive the relationships between appearance-related distress and health outcomes. Although theory can drive hypotheses, future research is needed to explore the mediational pathways in this area. One variable that may be particularly important in the pathway to HIV sexual transmission risk behaviors is condom self-efficacy. It is possible that elevated levels of appearance-related distress lead to lower levels of self-efficacy, which in turn predict decreased likelihood of condom use during intercourse [16, 51]. Other possible mechanisms that may be fruitful for examination are depression and substance use. It should also be noted that only bivariate associations were explored in this study, as we wished to first establish basic relationships between the ABCD-SF and its subscales with relevant HIV-related health outcomes. Exploring the relative contribution of the subscales to salient outcomes is an important avenue of future research. Finally, most participants in this

study were between 40 and 55 years of age. Although research examining body image among MSM across the lifespan is rather limited, it is possible that the relationships found in the current study may not translate to younger HIV-infected MSM. Thus, future research would benefit from validating the ABCD-SF among varied ages.

Conclusions

Appearance-related disturbances are relatively common among HIV-infected individuals; however, to date, there have been limited options for valid assessment of this construct among HIV-infected MSM, the largest risk group for HIV in the US, and a group that has a high prevalence of body image related concerns. The current study sought to assess the structural, internal, and convergent validity of the ABCD and its short-form (ABCD-SF) among a sample of HIV-infected MSM. This study found that the ABCD and the ABCD-SF represent valid means of assessing body image disturbance among HIV-infected MSM.

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Appendix: ABCD-SF

These questions are designed to learn more about how you've felt since starting your HIV medicines. There are no right or wrong answers to these questions.

Many people with HIV have noticed changes in their bodies. Have you noticed any of the following since you started taking HIV medicines?

Please circle one response for each statement.

In the *past 4 weeks*, the changes in my body made me:

In the <i>past 4 weeks</i>, the changes in my body made me:	None of the time 1	A little of the time 2	Some of the time 3	Most of the time 4	All of the time 5
1. ... confused about how to eat right	1	2	3	4	5
2. ... confused about how much to exercise	1	2	3	4	5
3. ... think about not taking my HIV medications	1	2	3	4	5
4. ... think about changing my HIV medications	1	2	3	4	5
5. ... afraid that people will know I have HIV	1	2	3	4	5
6. ... worry about dying	1	2	3	4	5
7. ... dislike the way I look	1	2	3	4	5
8. ... feel less self- confident	1	2	3	4	5
9. ... feel lonely and cut-off from others	1	2	3	4	5
10. ... avoid being around other people	1	2	3	4	5

Fig. 1.
Confirmatory factor analyses for ABCD—full scale

Fig. 2.
Confirmatory factor analyses for ABCD—short form

Table 1

Sample characteristics

Variable	M (SD)
Age	47.5 (7.8)
Years taking HIV medications	10.1 (6.8)
CD4 count	674 (281)
Viral load _{Log}	1.9 (.4)
Years since HIV diagnosis	13.1 (8.2)
Body mass index	27.1 (4.6)
Education level	<i>N</i>
High school or lower	25 (24 %)
Some college/college	60 (56 %)
> college	21 (20 %)
Race/ethnicity	
White	77 (73 %)
Black/African American	24 (23 %)
Hispanic/Latino	13 (12 %)
Native American	3 (3 %)
Other	5 (5 %)
Lipodystrophy	76 (72 %)
Lipohypertrophy	59 (56 %)
Lipoatrophy	54 (51 %)
ART medication category	
NRTIs	101 (95 %)
NNRTIs	16 (15 %)
Boosted PIs	33 (31 %)
Unboosted PIs	12 (11 %)
Detectable viral load	8 (8 %)

Frequencies of race/ethnicity and ART medication category sum to greater than 100 % as response options were not mutually exclusive. *M* mean, *SD* standard deviation, *N* number of participants. Prevalence of lipodystrophy, lipohypertrophy, and lipoatrophy was based participants endorsing at least one or more of the respective symptoms

Table 2

Exploratory factor analysis

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1: negative affect about appearance ($\alpha = .93$)				
Dislike looks	0.92	-0.07	-0.07	0.02
Less attractive	0.84	0.14	-0.18	-0.02
Lonely	0.78	0.16	-0.03	0.03
Avoid sex	0.76	0.00	0.06	0.04
Embarrassed	0.76	0.05	0.18	-0.09
Depressed	0.74	0.08	0.09	0.22
Avoid others	0.70	0.20	-0.12	0.19
Less confidence	0.68	0.18	0.02	-0.03
Frustrated clothes	0.62	-0.29	0.16	0.09
Pain	0.54	0.04	0.29	-0.03
Factor 2: HIV health-related outcomes/stigma ($\alpha = .78$)				
Others sick	0.07	0.85	-0.08	-0.05
Others HIV	0.17	0.74	0.02	-0.12
Worry HIV	-0.10	0.58	0.27	0.34
Worry dying	0.09	0.52	0.18	0.33
Factor 3: exercise/eating ($\alpha = .83$)				
Confused exercise	0.01	0.09	0.91	-0.05
Confused eating	0.04	-0.04	0.80	0.02
Factor 4: ART ($\alpha = .62$)				
Changing ART	0.02	-0.10	0.06	0.84
Nonadherence	0.05	0.04	-0.15	0.81
Total ABCD score ($\alpha = .93$)				

Table 3

Intercorrelations among body image measures

Measures	1	2	3	4	5	6	7	8
ART	1							
Eating/exercise	.17	1						
HIV outcomes/stigma	.22*	.25*	1					
Negative Affect	.33**	.32**	.52**	1				
ABCD-SF Total	.51**	.58**	.71**	.90**	1			
MBAS-R	.29**	.30**	.22*	.70**	.62**	1		
BASS	-.21*	-.21*	-.32**	-.75**	-.64**	-.72**	1	
AE	-.12	-.13	-.21*	-.65**	-.50**	-.62**	.80**	1

ABCD-SF assessment of body change and distress questionnaire—short form, AE appearance evaluation. BASS body area satisfaction scale. ART ART subscale of ABCD-SF, Eating/Exercise eating/exercise subscale of ABCD-SF, HIV Outcomes/Stigma HIV health-related outcomes/stigma subscale of the ABCD-SF, Negative Affect negative affect about appearance subscale of the ABCD-SF, MBAS-R male body attitudes scale—revised

* p .05
** p .01

Table 4

Intercorrelations of ABCD and other health outcomes

Measures	1	2	3	4	5	6	7	8
ART	1							
Eating/exercise	.17	1						
HIV outcomes/stigma	.22*	.22*	1					
Negative affect	.33**	.32**	.52**	1				
ABCD-SF Total	.51**	.58**	.71**	.90**	1			
CESD	.31**	.21*	.35**	.60**	.58**	1		
Self-report adherence	-.45**	-.18	-.16	-.17	-.29**	-.37**	1	
SDUAI	.39**	-.11	.31**	.07	.17	.03	-.26*	1

ABCD-SF assessment of body change and distress questionnaire—short form, ART ART subscale of ABCD-SF, Eating/Exercise eating/exercise subscale of ABCD-SF, HIV Outcomes/Stigma HIV health-related outcomes/stigma subscale of the ABCD-SF, Negative Affect negative affect about appearance subscale of the ABCD-SF, CESD center for epidemiological studies depression scale, SDUAI sero-discordant unprotected anal intercourse

*
p .05

**
p .01