PSYCHOLOGY, HEALTH & MEDICINE
VOL. 9, NO. 3, AUGUST 2004

BrunnerRoutledge Taylor & Francis healthsciences

# Development and validation of the Client Diagnostic Questionnaire (CDQ): a mental health screening tool for use in HIV/AIDS service settings

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**Abstract** *This study examines the validity, feasibility, and utility of the Client Diagnostic Questionnaire (CDQ), a brief diagnostic screening tool designed for use by non-mental health professionals and designed specifically to assess the range of psychiatric disorders known to be prevalent among persons infected with HIV or at high risk of infection: depression, anxiety, PTSD, substance abuse. Non-clinically trained personnel administered the CDQ to a diverse sample of 260 HIV infected individuals at six primary care or social service agencies; a second interview was conducted by an experienced mental health clinician. There was good agreement between positive screen on the CDQ and diagnosis made by an independent mental health professional. For the diagnosis of any disorder, sensitivity = 91%, specificity = 78%, and overall accuracy = 85%. Clients who screened positive for disorder based on the CDQ interview had significantly impaired mental health functioning compared to individuals without CDQ screening diagnosis. CDQ was well received by both clients and agency staff. Findings support the feasibility and utility of the CDQ. The CDQ can be used by providers in a range of service settings to identify persons in need of formal mental health assessment and treatment, to more effectively target scarce mental health resources, and to reduce the negative impact of unrecognized disorder on the health and well-being of individuals in their care.*

Numerous studies of HIV-infected individuals have revealed high rates of mental disorders, particularly depression, anxiety and trauma related disorders (Bing *et al.*, 2001; Lipsitz *et al.*, 1994; Mellins *et al.*, 2002; Morrison *et al.*, 2002; Turner *et al.*, 2001). As substance use is an important risk factor for HIV-infection (Centers for Disease Control and Prevention (CDC), 2002), co-morbid substance use and psychiatric disorders are also prominent (Douaihy *et al.*,

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ISSN 1354–8506 print/ISSN 1465-3966 online/04/030362–18 © Taylor & Francis Ltd
DOI: 10.1080/1354850041000172192 7

2003; Lipsitz *et al.*, 1994). Recently, a large study utilizing a nationally representative sample recruited from medical care settings reported that nearly half the sample screened positive for a psychiatric disorder (Bing *et al.*, 2001). In addition to their negative impact on quality of life (Sherborne *et al.*, 2000), psychiatric and substance use disorders have been consistently associated with poor access and adherence to anti-retroviral treatment for HIV/AIDS (Cook *et al.*, 2002; Ferrando *et al.*, 1996; Mehta *et al.*, 1997; Mellins *et al.*, 2002, 2003; Tucker *et al.*, 2003; Turner *et al.*, 2001). A number of studies have now suggested that adequate recognition of and treatment for psychiatric and substance use disorders are central to improving both health and mental health outcomes of HIV-infected individuals (see also AIDS Institute, 2001; Mellins *et al.*, 2003; Tucker *et al.*, 2003; Zinkernagel *et al.*, 2001).

There are both client and provider factors that serve to reduce the accessibility of mental health treatment to HIV positive people who are in need of care. One important barrier is the lack of client recognition or acknowledgment of mental health needs. Despite the remarkable advances over the last two decades in the understanding and treatment of mental illnesses, stigma and lack of knowledge about these conditions are pervasive (Cooper *et al.*, 2003; Kessler *et al.*, 2001; Regier *et al.*, 1993; US Department for Health and Human Services (HHS), 1999). Depression and anxiety disorders are often construed as personal weakness that should be under the individuals control (Corrigan *et al.*, 2002; Davidson & Meltzer-Brody, 1999). In the most extreme form of stigma, people resist seeking care from mental health professionals as they fear it will labels them as 'crazy'. Difficulties with symptom recognition are even more complex in individuals who are also using drugs. Often people do not recognize the role mental health problems have played in their drug use until they have entered and maintained recovery for a prolonged period.

For example, in an ongoing study of a representative sample of HIV-infected New York City residents (Messeri *et al.*, 2002), fewer than half of individuals with low scores on standardized measures of mental health functioning (indicating clinically relevant symptoms) receive any type of mental health services. In repeated multivariate analyses, controlling for a range of client characteristics and other services utilized, clients' self-perception of mental health problems and need for treatment or care was the most significant predictor of accessing care. However three in four persons reporting mental health symptoms answer 'no' to direct questions about emotional or psychological problems or need for mental health services (Aidala & Lee, 2001).

Client under-recognition of mental health problems is reinforced when their HIV care providers lack the expertise to adequately assess their mental health needs. Research has shown that primary care providers vary considerably in their ability to diagnose and treat patients suffering from common mental health disorders (Davidson & Meltzer-Brody, 1999; Spitzer *et al.*, 1994, 1999; Staab *et al.*, 2001). A similar problem plagues the social service delivery system. Case management is an important and widely available component of the assessment and coordination of HIV-related services. While assessment of psychosocial service needs is considered a routine part of the case management function, there are minimal guidelines for or training in the systematic assessment of clients' mental health needs. Similar to primary care providers, case managers vary enormously in their capacity to assess the signs and symptoms of psychiatric disorders (Kirk *et al.*, 1999).

Over the past 10 years, a number of diagnostic mental health screeners have become available for use in the general population of adults (Kessler *et al.*, 1998; Spitzer *et al.*, 1994, 1999) and their use has been shown to increase the identification of mental health disorders in patients presenting to primary care providers (Spitzer *et al.*, 1994). These instruments are superior to symptom check-lists that measure general psychological distress (Bufka *et al.*, 2002) or that focus on a single diagnosis such as depression, (e.g. Beck Depression Inventory,

Beck *et al.*, 1961; or the CES-D, Radoff, 1977). However, existing diagnostic screeners do not include the full range of disorders known to be prevalent in HIV-infected populations. Of particular importance is screening for post-traumatic stress disorder, given the well-documented relationship between that disorder and substance abuse and dependence (Ouimette *et al.*, 1998) as well as the evidence for elevated rates of trauma exposure among HIV-infected persons (Mellins *et al.*, 1997).

A diagnostic screening instrument is needed that can assess psychiatric and substance abuse disorders in HIV-infected adults. Routine screening of all clients would address client inability or reluctance to self-define their need for mental health services. A diagnostic tool, especially one that can be used by non-clinician ('lay') interviewers, would improve the ability to address mental health needs of clients in many primary care and social service settings where resources for professional mental health staff are limited. Systematic screening would allow the provider to more clearly identify mental health needs, indicating which clients should receive mental health services, either further assessment or direct referral for treatment by a clinician.

This article describes the development and validation of the Client Diagnostic Questionnaire (CDQ), a diagnostic screening tool designed for use by non-mental health professionals in AIDS service settings.[1]

## Description of the Client Diagnostic Questionnaire

The CDQ is based on the Patient Health Questionnaire (PHQ) version of the PRIME-MD, a mental health tool developed for use in primary care settings by Robert Spitzer and colleagues (Spitzer *et al.*, 1994, 1999). The CDQ collects data in symptom clusters that are organized to yield the likelihood of a current diagnosis. The screener follows diagnostic criteria specified by the Diagnostic and Statistical Manual of Mental Disorders published by the American Psychiatric Association, the standard diagnostic schema utilized by mental health professionals in the USA.[2]

The instrument consists of separate modules, one for each disorder. Each module starts with one or two questions determining initial criteria for a disorder. If initial symptoms are affirmed, further questions are asked within the diagnostic category; otherwise, the interviewer skips to questions about the next disorder (module) in the CDQ. Scoring rules are printed at the end of each diagnostic module and indicate clients who screen positive for specific DSM-IV diagnoses including a number of 'subthreshold' diagnoses. Criteria for subthreshold diagnoses encompass fewer symptoms than are required for any specific DSM-IV diagnosis but are included because symptoms in these areas are themselves associated with considerable functional impairment and warrant monitoring and possible treatment (Surgeon General's Report; Solomon *et al.*, 2001; Ornel *et al.*, 1993). In addition, the subthreshold symptom patterns may be indicators of other disorders not included in the screener that would also warrant more complete assessment by a mental health professional.

The original PRIME-MD screened for depression, panic and other anxiety disorders, alcohol abuse, somatoform, and eating disorders. Revisions were necessary in both the range of disorders addressed, and the language used in asking symptom questions in order to create a screening tool appropriate for use with HIV-infected populations. Somatoform and eating disorders were dropped due to the possibility of illness related confounds (e.g., loss of appetite is associated with HIV symptoms and antiretroviral medications). Modules were added which screen for drug abuse and posttraumatic stress disorder. Alcohol and drug abuse in the past 6 months, as well as in the past 30 days is assessed. A screener for the presence of psychotic symptoms was also added, given elevated rates of HIV disease in the severely mentally ill

(Blank *et al.*, 2002; Gray *et al.*, 2002). For several diagnostic modules, changes in wording from the original Prime-MD were needed when symptoms were anchored by reference to impairment or interference with work or family responsibilities. Many persons living with HIV are unemployed and/or homeless, separated from children, or otherwise limited with regard to family or household activities. The CDQ is interviewer administered and care was taken to use simple language for symptom questions. Reading level for the CDQ was assessed at US grade school level of 5.6 using the Flesch-Kincade test (Flesch & Lass, 1996).

The additional modules were based upon existing work done in developing screening questionnaires for substance abusers (Johnson *et al.*, 2002), and people with psychosis (Susser & Struening, 1990). The PTSD module was informed by the development and field testing of trauma screeners used in several community health assessments conducted in inner city, low income, minority neighbourhoods (Briggs *et al.*, 1999; Fullilove *et al.*, 1999). Traumatic events were selected from a longer list developed by the National Comorbidity Study (Kessler *et al.*, 1995). The symptom questions and scoring algorithm followed DSM-IV criteria and were adapted from a screener developed for a treatment study of trauma exposed children and youth (Tosyali, 1996) and pre-tested and refined with the assistance of collaborators at the University of Miami (Dodds *et al.*, 2000). All revisions were made in consultation with the developers of the original PRIME-MD instrument.

## Study questions

The purpose of this study is to examine the validity, feasibility, and utility of the lay-administered Client Diagnostic Questionnaire (CDQ) in a heterogeneous sample of HIV-infected patients and clients recruited from different medical and social service settings. The following research questions were addressed:

(1) To what extent do positive screenings for disorders generated by the structured CDQ used by lay interviewers agree with diagnoses made by experienced mental health professionals? The clinical assessment by the mental health professional comprises the 'gold standard' criterion.
(2) Are the rates of psychiatric disorders found by lay interviewers using the CDQ comparable to those obtained by trained, experienced, mental health professionals?
(3) Is there a substantial relationship between a positive screen for disorder generated by the lay interviewer using the CDQ and client scores on a standardized, self-rated symptom severity scale?
(4) What is the average amount of time required by lay interviewers to complete administration of the structured CDQ?
(5) How do patients and clients respond to the CDQ screening interview? Are they comfortable being asked questions about psychological symptoms?
(6) Do service staff at non-mental health agencies find the information obtained with the CDQ of value in service planning for HIV infected patients and clients?

## Methods

### *Research design*

This is an instrument validation study using a cross-sectional sample of HIV infected individuals. Data were collected through personal face-to-face interviews. An initial interview using the structured CDQ was conducted by non-clinically trained personnel such as case

managers ('lay' interviewers) as part of the normal, routine flow of care and services at six HIV primary care or social service agencies.

A second, study-specific interview was conducted within 1 week of the initial interview by an experienced mental health clinician such as a psychiatrist, psychologist or clinical social worker.[3] Clinicians were blinded to the results of the initial screening interview. Research participants were compensated $15 for their time and participation in the second (instrument validation) interview. The study protocol was approved by the Institutional Review Boards of each study site. The multi-site protocol and validation study analysis was approved by the Columbia University IRB.

### *Study sites*

Sites were chosen to ensure a diversity of AIDS service settings including hospital based HIV clinics, community clinics, and multi-service organizations: Five of the study sites were programmes funded through the Health Resources Services Administration (HRSA) Special Projects of National Significance (SPNS) Program or the Housing and Urban Development (HUD) Housing Opportunities for Persons with AIDS (HOPWA) Multiple Diagnoses Initiative. The Whole Life Program based at the University of Miami Jackson Memorial Hospital (women in HIV primary care or ob/gyn clinics); the Vocational Rehabilitation and Job Training Program at Harbor-UCLA Medical Center in Torrence, California (serving primarily HIV infected men); Health Care for the Homeless neighbourhood clinic in Baltimore, Maryland (serving homeless or unstably housed men and women); AIDS Alabama in Birmingham, Alabama (a multi-service community based organization for persons living with HIV/AIDS); the Integrated Services Project at Duke University Medical Center Infectious Disease Clinic in Durham, North Carolina (hospital based clinic with a large rural catchment). The sixth site was the Infectious Disease Clinic of the Columbia Presbyterian Medical Center (CPMC) in New York City.

### *Study population and recruitment*

A sequential quota sampling methodology was used to recruit a sample of HIV infected individuals. All enrolled clients or patients presenting to the study sites for services on selected recruitment days and who met inclusion criteria were invited to participate in the study until a quota of 50 study participants per site was reached. At the CPMC site, the first 50 clients who completed follow-up interviews as part of a larger study of medication adherence were recruited for the CDQ validation study. Inclusion criteria were (1) confirmed HIV seropositivity; (2) age 18 or older; (3) conversant in English. Language restriction was necessary due to the relatively small sample size and thus inability to conduct validity analyses within separate linguistic groups. Individuals were excluded if they had a medical (e.g. deafness) or mental condition (severe dementia) that did not permit the interviews.

From April 1999 to August 2000, a total of 297 individuals completed the initial CDQ interview and participated in the second interview completed by a mental health professional. However, a number of participants failed to complete the second interview within 7 days of the initial assessment reducing the sample for the validation study to 260. In the analyses that follow, comparison of diagnostic results for lay and clinician interviews will be restricted to the validation sample of 260. The validation subsample is comparable to the larger screened sample except gender breakdown; more women than men were able to complete the second interview within the 7 day time period.

*Instruments and data collection*

A total of 17 lay interviewers (2 to 6 per site) conducted initial CDQ screening interviews. By design, all lay interviewers had no formal, academic, or clinical training or experience in mental health diagnosis and their educational level was undergraduate degree or less. They were required to have some experience working with HIV/AIDS or similar underserved populations but no further requirements were imposed in the interest of testing the CDQ as it would likely be implemented in HIV clinical and service agency settings. Lay interviewers for the study were for the most part case managers, but also included intake workers, administrative support staff, and non-clinical research interviewers.

A 6–8 h training session was conducted for lay interviewers consisting of general information about the nature of mental illness and the use of diagnostic instruments as assessment tools, didactic information about administration and scoring of the CDQ and role play practice administration of the CDQ with observation and corrective feedback by the trainer. These training sessions were all conducted by the first author with further training provided by onsite personnel when needed. At five of the sites, the initial CDQ screening was conducted as part of the routine initial intake or client assessment process in each clinic or agency setting. At the CPMC site, individuals who had been recruited from the infectious disease clinic to participate in a study of medication adherence were screened using the CDQ at their first follow-up interview. At the close of the initial screening, the interviewer informed eligible clients of the opportunity to participate in the CDQ validation study and obtained signed informed consent. The second interview was scheduled as soon as possible with consenting clients.

A total of 13 mental health professionals (1–5 at each site) re-interviewed consenting clients subsequent to their completion of the CDQ screening conducted by the lay interviewer. Mental health professionals were formally trained, clinical mental health professionals with advanced degrees (PhD, CSW, MA) and a minimum of 2 years full-time experience in the provision of direct mental health services. Mental health professionals for the validation study included clinical psychologists, and clinical social workers. A 3–4 h training session was conducted for clinician interviewers consisting of didactic information about administration and scoring of the CDQ, didactic information about administration of the supplemental open-ended items (overview, probes) and review of issues in differential diagnoses. Training of mental health professionals was conducted via use of a training tape and a series of phone conference calls by the senior clinical instructor of the Biometrics Research Unit of New York State Psychiatric Institute.

The clinicians used a semi-structured version of the CDQ which included a non-structured overview section, questions about rule-outs, prior episodes and treatment experience. These additional questions were taken from the Structured Clinical Interview (SCID) (First *et al.*, 1996). As with any clinical assessment, the mental health professional was encouraged to probe ambiguous responses and ask additional clarifying questions that might reveal symptoms not addressed by the more structured and limited CDQ brief screener. Clinical assessments took on average 40 min to 1 h to complete.

As part of the validation study, a standardized measure of current mental functioning based on the MOS-SF12, Medical Outcomes Survey (Ware *et al.*, 1996), was administered to a subset of clients ($n = 151$). A series of subscales are combined into the 'mental component summary score' (MCS) which is a measure of general mental health functioning. The subscales measure symptoms of depression and anxiety, impaired role functioning with regard to work or other responsibilities, impaired social functioning in terms of social relationships and activities, and low energy or listlessness. Scores on the

MOS mental health measures provide additional construct validity criteria for evaluating the CDQ.

At the close of each screening interview, the lay interviewers completed a separate assessment form evaluating the usefulness of information obtained with the CDQ and reporting on the client's understanding, comfort, and candor during the interview.

## Results

### *Sample description*

Demographic and health characteristics of the sample are shown in Table 1. The mean age of clients was 37.8 years (SD 8.8 years) with a range of 18 – 61 years. The screened sample was evenly divided between males and females with 1% (2 individuals) identifying themselves as transgendered. The overwhelming majority, 72%, of the sample are Black/African American. Educational level is relatively low with over one-third (35%) having less than a high school education; only 8% were college graduates. Twenty-eight percent described themselves as gay, lesbian or bisexual. The sample included individuals at different stages of HIV disease: 30% had CD4 counts below 200/mm$^3$, 34% had counts at 500/mm$^3$ or higher and the remainder were in-between.

**Table 1.** *Sample descriptives*

| Total sample ($n$ = ) | (297) |
|---|---|
| Age | |
| Mean age | 37.8 years |
| (std dev) | (8.8 years) |
| Gender | |
| Male | 49% |
| Female | 50 |
| Transgender | 1 |
| Race/ethnicity | |
| Black | 72% |
| White | 13 |
| Hispanic | 9 |
| Other/mixed | 6 |
| Education | |
| Less than high school | 35% |
| HS grad/GED | 30 |
| Post-secondary | 35 |
| Sexual Orientation | |
| Straight | 66% |
| Gay, Lesbian, Bisexual | 28 |
| Unsure, not say | 6 |
| CD4 Count | |
| < 200 | 30% |
| 200 – 499 | 26 |
| 500 + | 34 |
| Don't know; no test | 8 |
| Recruitment site | |
| Hospital HIV clinic | 57% |
| Clinic for homeless | 14 |
| Social service agency | 29 |

*Comparison of CDQ screenings and clinician interviews*

Table 2 presents several measures of agreement between a positive screen for disorder made by a lay interviewer using the CDQ and diagnosis made by the mental health professional in the second validation interview. The clinician interview is regarded as the diagnostic criterion standard for assessing the validity of the lay interviewer's CDQ evaluation. The first column presents *sensitivity* or the proportion of cases given a diagnosis by the clinician that were correctly identified by the lay interviewer. High sensitivity guards against false negatives—failing to recognize disorder that exists. Next is *specificity*, the proportion of cases with no disorder as determined by the mental health professional that were correctly identified by the CDQ screening interview. *Positive predictive value* is the proportion of cases who screened positive in the CDQ lay interview that were correctly identified. The final validation measure is *overall accuracy* or the proportion of total cases that were correctly identified by the CDQ lay screening interview that were assessed by the clinician as having or not having the diagnosis.

Sensitivity was excellent for any psychiatric diagnosis including substance abuse disorders, and any diagnosis without substance abuse: 91 and 89% respectively. This indicates that 90% of clients who had one of the DSM-IV diagnoses addressed by the screener would be correctly identified by a non mental health professional using the CDQ. Specificity for any diagnosis is good at 78% indicating that only one in five persons who screen positive on the CDQ do not meet full criteria for current psychiatric disorder. Almost all individuals who screened positive on the lay CDQ but who did not receive a clinician diagnosis were experiencing clinically relevant symptoms. Clinicians recorded an average of seven psychiatric symptoms for these clients, excluding impairment associated with substance use.

Sensitivities at the level of broad diagnostic categories were 63% for any mood disorder, 89% for any anxiety disorder, and 87% for any substance abuse disorder (Table 2). Sensitivities for the specific diagnoses were lower, ranging from 55% for panic disorder to 83% for drug abuse or dependence. Specificity ranged between 80–90% across the diagnostic modules. Overall accuracy rates across modules and specific diagnostic categories were generally very good. Note that although psychosis was included in the 'any diagnosis' category,

**Table 2.** *Measures of diagnostic accuracy: Clinician vs. non-mental health professional (lay) positive screen*

| | Sensitivity | Specificity | Positive predictive value | Overall accuracy | Kappa | Lay prevalence | Clinician prevalence |
|---|---|---|---|---|---|---|---|
| Any diagnosis | 91% | 78% | 82% | 85% | 0.70 | 59% | 53% |
| Any diagnosis excluding substance abuse disorder | 89 | 79 | 69 | 82 | 0.63 | 46 | 36 |
| Any mood disorder | 63 | 94 | 59 | 90 | 0.55 | 13 | 12 |
| Any anxiety disorder | 89 | 79 | 64 | 82 | 61 | 42 | 30 |
| Any substance abuse disorder | 87 | 93 | 84 | 91 | 0.79 | 31 | 30 |
| Major depressive disorder | 60 | 96 | 63 | 93 | 0.57 | 9 | 10 |
| Panic disorder | 55 | 96 | 54 | 93 | 0.50 | 8 | 8 |
| Generalized anxiety disorder | 66 | 93 | 60 | 89 | 0.56 | 16 | 14 |
| PTSD | 82 | 79 | 51 | 79 | 0.49 | 34 | 21 |
| Alcohol abuse/dependence | 81 | 93 | 74 | 92 | 0.72 | 20 | 19 |
| Drug abuse/dependence | 83 | 98 | 89 | 95 | 0.83 | 17 | 19 |

Note: Clinician assessment within 7 days of initial CDQ screening.

it was not possible to formally determine diagnostic accuracy of the psychosis module due to too few cases (2%, $n = 5$) of schizophrenia and other psychotic disorders among the screened population.

The next column in Table 2 presents the kappa coefficient (Cohen, 1960) which is an index of agreement between the lay interviewers and the mental health professionals for each diagnosis, correcting for agreement due to chance. The agreement for any diagnosis was good at 0.70. Agreement for the diagnostic modules varied with highest agreement for any substance abuse disorder (0.79) and lowest for any mood disorder (0.55). However kappas were at least satisfactory for all modules.

The final two columns in Table 2 show prevalence for the different diagnoses based on CDQ lay interviews and clinician assessments of the same clients as an indicator of the likelihood that the CDQ would systematically under screen (fail to identify true cases) or over screen (prone to false positives) for psychiatric disorder. Again the best comparison is seen at the level of any diagnosis. The greatest difference in prevalence rates is for PTSD. About one-third (34%) of all clients screened positive for PTSD on the lay CDQ interview compared to 21% who were given a diagnosis of PTSD by the mental health professional. This differential carries over in the comparative rates of any anxiety disorder. However rates for any mood disorder, any substance abuse disorder, as well as the specific diagnoses of major depression, panic disorder, generalized anxiety disorder, alcohol abuse, and drug abuse are nearly identical.

### *Prevalence estimates*

Overall, 59% of all clients assessed screened positive for a CDQ diagnosis based on the brief screening by a lay interviewer. This is comparable to any diagnosis rate of 53% determined by clinician interview (Table 2). Thirty-seven percent (37%) of clients screened positive on more than one diagnostic module in the CDQ lay interviews. The rate of two or more separate disorders as determined by clinical assessment was 25%. The most common co-occurrence in both lay and clinician assessments was substance abuse and anxiety disorder but substance abuse and depression was also common. In the interviews by mental health professionals who were directed to rule out symptoms accounted for solely by substance use, 42% of individuals with a non-substance related DSM-IV psychiatric diagnosis also had a current substance abuse disorder.

### *Relationship of CDQ results to symptom scales*

Positive screen for diagnosis on the CDQ was associated with lower scores on the MOS-SF12 mental health functioning scale (Ware *et al.*, 1996) (Table 3). For individuals who screened positive for any disorder, mean scores on the summary mental health functioning score (MCS) was 41.10 (SD 11.6), significantly lower than the mean score of 51.69 (SD 13.7) for individuals who screen negative on the CDQ, indicating no diagnosis ($p < 0.000$). Mental health functioning as indicated by the SF-12 MCS is even lower for individual who screen positive for any CDQ diagnosis excluding substance abuse disorder – mean score of 37.92 (SD 11.3). The MCS is standardized and normed such that a MCS summary scale score below 42.0 is considered evidence of clinically relevant symptomotology (McHorney *et al.*, 1993; Ware *et al.*, 1994).

Table 3 also presents select single items from the MOS SF-12 instrument that are indicators of self-reported impairment associated with 'any emotional problems'. Also presented are scores from the depression/anxiety subscale, which asks about symptoms the

**Table 3.** *CDQ results and mental health functioning items and symptom scales*[1]

| | Screened subsample | CDQ positive screen for any diagnosis | CDQ positive excluding substance abuse | CDQ screen negative | Signif.[2] |
|---|---|---|---|---|---|
| Happy none or only a little of the time during the past 4 weeks | (154) | 49.5% | 60.0% | 11.8% | $p < 0.000$/ $p < 0.000$ |
| Difficulties during the past 4 weeks as the result of any emotional problems: | | | | | |
| Accomplished less | (106) | 55.4% | 70.9% | 12.5% | $p < 0.000$/ $p < 0.000$ |
| Didn't do activities as carefully | (106) | 42.4% | 54.5% | 15.6% | $p = 0.000$/ $p = 0.005$ |
| Depression/anxiety subscale mean (sd) | (154) | 55.59 (22.9) | 48.56 (21.7) | 77.30 (13.8) | $p < 0.000$/ $p < 0.000$ |
| Summary mental health functioning score mean (sd) | (106) | 41.10 (11.6) | 37.92 (11.3) | 51.69 (13.7) | $p < 0.000$/ $p < 0.000$ |

[1]MOS-SF 12 mental health summary scale (MCS) and select component items (Ware *et al.*, 1996).
[2]CDQ positive screen for any diagnosis and CDQ positive screen for any diagnosis excluding substance abuse each compared to CDQ negative or 'no diagnosis' $\chi^2$ test for dichotomous variables and one way analysis of variance *F*-test for continuous scale scores.

past 4 weeks. Both emotional symptoms as well as impairment from symptoms vary as expected among individuals who screen positive for diagnosis using the CDQ. For example, individuals with a CDQ diagnosis were 4 – 5 times more likely to report that they accomplished less than they would have liked during the past 4 weeks due to emotional problems (55.4% and 70.9% compared to 12.5% among those with no CDQ diagnosis). A positive screen on the CDQ is associated with statistically significant lower scores indicating greater severity of symptoms.

### *Length of time for CDQ screening*

Table 4 presents information on length of time to administer the CDQ as well as a number of indicators of client response and acceptance of the screening interview. The CDQ took on average between 15 to 20 minutes to administer (median time to completion 18.0 min). Average time to complete the CDQ varied by site, likely reflecting differences in client composition. However, conditions of administering the interview must also be taken into consideration. Interviewers reported a range of interruptions associated with screenings conducted in busy office and clinic settings, often with constraints on space and privacy likely to affect the length of time needed to complete the screening interview. In the validation study sample, length of time for the CDQ was shortest in HIV primary care medical settings (median time to complete: 10.0 min).

### *Client response to the CDQ*

The CDQ was well-received by clients. Table 4 also presents results of interviewer reports of clients' reaction to completing the CDQ screening interview. Seventeen interviewers at five of

**Table 4.** *Length of screening interview and client response*

| Total sample ($n=$) | (241) |
|---|---|
| Length of Screening Interview | |
| 15 min or less | 36% |
| 25 min or less | 76% |
| 35 min or less | 92% |
| Median time to complete | 18.0 min |
| Range | 5–81 min |
| Client Interest | |
| Consistently engaged, showed interest | 90% |
| Interest and engagement varied | 7 |
| Client lacked interest | 3 |
| Client Understanding | |
| Understood all questions with no difficulty | 96% |
| Some difficulty with understanding | 4 |
| Client Honesty | |
| All questions answered honestly | 97% |
| Some questions not answered honestly | 3 |
| Comfort Level | |
| Completely comfortable, not upset | 88% |
| Slightly uncomfortable by some questions | 10 |
| Moderately uncomfortable by some questions | 2 |
| Client 'very upset' | 0 |

Note: Based on interviewer's report at the close of each screening interview. 17 interviewers reporting from 5 sites.

the study sites provided information on about 241 clients screened. Clients were engaged and showed interest throughout the interview (90%). Very few had any problems with understanding the symptom questions; 96% understood all questions with no difficulty. Interviewers felt that for the most part, clients answered all questions honestly, including more sensitive questions about drug use and traumatic experiences. For example, the correlation between total number of illegal substances acknowledged in the lay and clinician interviews was 0.880; the correlation between numbers of traumatic experiences reported under the two different interview conditions was 0.841. The high correlation between symptoms reported to the lay interviews and symptoms reported to the mental health professional with the training and experience to address client lack of candor is further evidence of success of the CDQ screening approach.

Providers are appropriately concerned about patient and client comfort levels when asked sensitive questions, especially questions that require reporting on unpleasant or possibly upsetting experiences. All lay CDQ interviewers were asked: 'Were there any questions that made the client uncomfortable or upset?' If yes, interviewers rated the level of participant discomfort on a scale from 1 'slightly uncomfortable' to 7 'very upset.' Interviewers were trained to note and report subtle as well as explicit behaviour and verbal cues indicating discomfort. As Table 4 shows, the great majority (88%) of clients were not at all uncomfortable with the CDQ screening interview. Of those who expressed any degree of discomfort, the trauma section was most often the module of concern. However, among those with any discomfort, the average discomfort rating was 1.9 or only 'slightly' on the scale. There were no instances of clients becoming extremely distraught or 'very upset' by the symptom questions.

*Staff response to the CDQ*

The lay interviewers were also asked to report on the extent to which the CDQ screening interview brought out information about the client or patient that would not have been obtained by the usual and customary intake process at the clinic or agency. Four out of five (80%) felt that additional information was obtained (data not shown). Interviewers were asked to rate the information provided by the CDQ with regard to the usefulness of information obtained for helping understand the client's service needs; 86% said the information was useful to them or would be to other direct service providers. In debriefing sessions with supervisors, interviewers reported that the CDQ was easy to administer, easy to score and interpret, and responsive to clients.

There is no evidence of site differences in the accuracy of CDQ screenings. There are some differences in accuracy of CDQ screenings among lay interviews who did not complete the full CDQ training session; however numbers are too small for statistical analysis. The CDQ is a user friendly instrument but as with all standardized tools, some training is needed to ensure appropriate understanding of underlying conceptual issues (e.g. symptoms of disorder meant to be elicited by the questionnaire items) as well as conventions for accurate administration of the questionnaire (e.g. following skip patterns).[4]

## Summary and discussion

To our knowledge, the CDQ is the first brief psychiatric diagnostic screening interview designed specifically to assess the range of mental health disorders known to be prevalent in HIV positive populations. Few instruments have been tested on the diverse ethnic and cultural groups, many with relatively low educational levels, increasingly common in HIV medical or social service settings (Karon *et al.*, 2001). In addition, many of the existing brief screening instruments require a separate, computer-based scoring process that limits their use as a rapid triage instrument. In contrast, the CDQ is designed to be immediately scored by the interviewer with results that will reliably indicate which clients screen positive for a DSM-IV current disorder and should be referred for a more complete, mental health assessment and treatment or services as necessary.

This validation study provides considerable support for the validity and utility of the CDQ. Sensitivity of the CDQ at the level of any diagnosis is excellent. Agency staff with no mental health training or experience correctly identified 90% of all clients who did in fact have a DSM-IV disorder as confirmed by the clinician assessment. Specificity is good at 78%. The vast majority of individuals who screen positive on the lay CDQ but do not receive a clinician diagnosis nonetheless report many psychiatric symptoms—symptoms likely to interfere with their management of their medical condition, their ability to care for their children, their ability maintain housing, their success in drug treatment. They are likely to benefit from some type of mental health service such as supportive counselling or participation in a support group, even though psychiatric treatment may not be indicated. Formal assessment of these sub-threshold cases by a mental health professional would provide important information on how best to serve them.

The sensitivity, specificity, and overall accuracy of the CDQ are comparable to the original PRIME-MD (see Table 5). For example, for any diagnosis, statistics for the PRIME-MD are 83% sensitivity, 88% specificity, and 86% overall accuracy. Comparable statistics for the CDQ are 91% sensitivity, 78% specificity, and 85% overall accuracy. The CDQ tends to be more sensitive and somewhat less specific than the original Prime-MD although strict

**Table 5.** *Comparison of diagnostic accuracy: CDQ and PrimeMD*

| | CDQ[1] | PrimeMD[2] |
|---|---|---|
| Total sample ($n$ = ) | (260) | (431) |
| Any diagnosis | | |
| Sensitivity | 91 | 83 |
| Specificity | 78 | 88 |
| Kappa | 0.70 | 0.71 |
| Any mood disorder | | |
| Sensitivity | 63 | 67 |
| Specificity | 94 | 92 |
| Kappa | 0.55 | 0.61 |
| Any anxiety disorder | | |
| Sensitivity | 89 | 69 |
| Specificity | 79 | 90 |
| Kappa | 0.61 | 0.55 |
| Major depressive disorder | | |
| Sensitivity | 60 | 57 |
| Specificity | 96 | 98 |
| Kappa | 0.57 | 0.61 |
| Panic disorder | | |
| Sensitivity | 55 | 57 |
| Specificity | 96 | 99 |
| Kappa | 0.50 | 0.60 |
| Generalized anxiety disorder | | |
| Sensitivity | 66 | 57 |
| Specificity | 93 | 97 |
| Kappa | 0.56 | 0.52 |
| Alcohol abuse/dependence | | |
| Sensitivity | 81 | 81 |
| Specificity | 93 | 98 |
| Kappa | 0.72 | 0.71 |

[1]CDQ screening completed by lay interviewer compared to clinical assessment by mental health professional.
[2]PrimeMD screening completed by primary care physician compared to clinical assessment by mental health professional. Spitzer *et al.* (1994).

comparisons are not possible given the sharp differences in populations studied (AIDS patients vs. adults at general medical clinics).

The construct validity of the CDQ is supported by the findings that clients who screen positive for disorder based on the CDQ interview have significantly impaired mental health functioning as indicated by an established measure (MOS-SF12) compared to individuals without CDQ screening diagnosis. Item analysis indicates strong relationship between CDQ screening diagnosis and client self-rated symptom severity and functional impairment associated with 'emotional problems'.

There are several limitations to this study. Although clients were recruited from a range of different HIV medical and social service sites, it is not a random sample of persons living with HIV/AIDS. In addition, sample sizes were relatively small and not all types of disorder were seen within the screened sample in sufficient numbers for statistical analysis. This is especially the case for psychotic disorder. Too few cases were detected to compare validity of the psychosis screening module with clinician assessment. If a significant numbers of persons with psychotic disorder are expected among the service population being screened, it is

recommended that additional information be used to confirm positive screen for psychosis. Because of the difficulty of simple questionnaire items to determine schizophrenia or other psychotic disorders, observational ratings are also recommended and a check list is provided (flat or inappropriate affect, disorganized speech, bizarre appearance etc.). If few persons with psychotic disorder are expected among the target population, the psychosis module of the CDQ screener could be dropped without compromising overall accuracy of the screening tool.

Another limitation is the restriction to English only version of the screening tool. Further research is needed to develop and test the CDQ among different cultural and linguistic groups. The CDQ has been translated into Spanish and field tested among diverse Latino cultural groups (Mexican, Puerto Rican, Dominican, and Cuban) but a formal validation study of the Spanish language version of the instrument has not been completed.

The CDQ brief screener does not contain questions to determine rule outs or classification criteria needed for differential diagnosis when symptoms of multiple disorders are reported. Thus symptoms can contribute to more than one screening diagnosis. This maximizes sensitivity, but results in lower specificity at the level of individual diagnoses. The goal was to develop a brief instrument that would be accurate at the level of 'any diagnosis' for use by non mental health professionals to detect mental health service needs that might otherwise go unrecognized.

The differential in positive screen for PTSD given by the lay interviewers compared to the assessment by a trained clinician warranted further investigation. A separate series of analyses was undertaken to investigate inconsistencies. There was a very high prevalence of exposure to trauma and violence in the sample overall. As Table 6 shows, 90% of the entire sample had one or more traumatic experiences; the mean number of events reported was 3.74 (SD 2.4) for men and even higher, 3.94 (SD 2.7) for women. Seventy-one percent (71%) of women and 59% of men had experienced some form of interpersonal violence. A third (33%) of all women and 22% of men were victims of sexual assault or rape as a child or adolescent. It is likely that

**Table 6.** *Traumatic experience by gender*

| | Men | Women |
|---|---|---|
| Total sample ($n=$) | (118) | (139) |
| Experienced any trauma or violent event | 90% | 92% |
| Mean (SD) number of traumatic events | 3.74 (2.4) | 3.94 (2.7) |
| Experienced violence | 59% | 71%* |
| Direct combat experience | 3 | 0 * |
| Physical assault by spouse/partner | 24 | 50 *** |
| Physical assault by other than a partner | 30 | 17 * |
| Physical assault or abuse as a child | 37 | 31 |
| Sexual assault or rape as an adult (18 + yrs) | 9 | 30 |
| Sexual assault or rape as a child or adolescent | 22 | 33 |
| Witnessed violence | 79% | 72% |
| Seeing someone physical assaulted | 59 | 49 |
| Seeing someone seriously injured or violently killed | 48 | 46 |
| Witnessing family violence | 52 | 42 |
| Other traumatic events | 59% | 62% |
| Serious accident or fire | 24 | 21 |
| Natural disaster (e.g. Hurricane, flood) | 26 | 31 |
| Losing a child through death | 9 | 17 * |
| Other terrible or frightening event | 29 | 26 |

* $p \leqslant 0.05$ ** $p \leqslant 0.01$ *** $p \leqslant 0.001$.

many individuals in the sample continue to experience enduring emotional effects of these experiences.

Focusing on the 44 individuals screened positive for PTSD on the lay CDQ interview but did not receive the diagnosis by the clinician, 80% of them had experienced one or more traumatic event that was very frightening or upsetting to them and report several PTSD symptoms in the past 6 months. The clinician determined that their current symptom pattern was not sufficient to warrant the PTSD diagnosis. Nonetheless almost two thirds (64%) of the 44 individuals did receive some other diagnosis based on the assessment by a mental health professional, most often another anxiety disorder and/or substance abuse. It would seem that the CDQ positive screen for PTSD is picking up symptoms of disorder that would warrant further attention and monitoring, even if subthreshold for the specific diagnosis of PTSD. Several studies have shown that subthreshold PTSD is associated with levels of impairment comparable to full PTSD (Zoltnick *et al.*, 2002; Marshall *et al.*, 2001).

In summary, the CDQ is a brief and sensitive diagnostic screener, acceptable to both interviewers and interviewees, which provides assessment of the range of mental health disorders common in HIV-infected populations. It can be used effectively by interviewers with little or no mental health training in a diverse range of HIV service settings, allowing for the effective identification of persons in need of further assessment and treatment. We would expect these findings to generalize to other service settings where clients present with high rates of mental health and substance abuse problems, but where access to mental health professionals is limited: homeless service providers, drug treatment programmes, criminal justice settings. When combined with facilitated access to psychiatric and substance use treatment, systematic screening of clients with the CDQ can increase the capacity of service providers to more effectively target scarce mental health resources and to reduce the negative impact of unrecognized disorder on the health and well-being of individuals in their care.

## Acknowledgements

Funding for the validation study was provided by Health Resources and Services Administration, HIV/AIDS Bureau 1BRH 970181-01. Special thanks is due to Robert L. Spitzer, MD and Janet B. Williams, DSW who provided invaluable assistance in developing the CDQ screening instrument, designing the validation study, and preparation of this manuscript. Thanks also to Miriam Gibbon, MSW who helped train the clinician interviewers.

## Notes

[1] The CDQ was developed as part of a national, multi-site evaluation study of medical and social service programmes that had received demonstration grants from either Health Resources Services Administration (HRSA) Special Projects of National Significance (SPNS) Programme or the Housing and Urban Development (HUD) Housing Opportunities for Persons with AIDS (HOPWA) Multiple Diagnoses Initiative.

[2] The CDQ was developed based on DSM-IV diagnostic criteria, prior to the publication of the DSM-IV TR revisions (American Psychiatric Association, 2000). However, there are no DSM-IV-TR changes in diagnostic criteria for any of the disorders that are covered by the CDQ. Thus the screening tool would yield the same results following either diagnostic system.

[3] The original protocol called for re-interview within three days of initial screening interview; however, the logistics of arranging return of clients for face to face assessment by a clinician within 3 days proved to be impossible for many, especially among clients residing in rural areas with difficult transportation needs. The use of phone re-interviews by clinicians was not an option due to limited phone coverage among AIDS service populations, especially those seen in homeless service programmes. In addition, client comfort and candor when discussing sensitive topics is less among vulnerable populations which would compromise the integrity of the instrument comparison in unknown ways (for recent review see, Holbrook *et al.*, 2003).

[4] A CDQ Interviewers Training Manual and additional training resources were developed in collaboration with Cicatelli Associates, Inc. Development of training materials was supported by a grant from the US Health Resources and Services Administration (HRSA) through the New York City Department of Health to the Medical and Health Research Association of New York City, Inc. (#BRH890015-08-0). The CDQ instrument and training materials are available from the first author or from Cicatelli Associates, Inc. at http://www.cicatelli.org

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