



Family-level predictors and correlates of the duration of untreated psychosis in African American first-episode patients

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ARTICLE INFO

Article history:

Received 27 May 2009

Received in revised form 18 September 2009

Accepted 22 September 2009

Available online 14 October 2009

Keywords:

Caregiver strain

Duration of untreated psychosis

Family functioning

First-episode psychosis

Schizophrenia

Treatment delay

ABSTRACT

Background: Little is known about how family-level factors are associated with duration of untreated psychosis (DUP), especially in ethnic/racial minority groups, such as African Americans. This study involved African American first-episode patients and their family members who initiated evaluation and treatment for them. It was hypothesized that a longer DUP would be predicted by family members' endorsement of: (1) less knowledge about schizophrenia, (2) greater perceptions of stigma, (3) lower levels of insight, (4) fewer family strengths, (5) more limited family coping capacity, and (6) lower levels of caregiver strain.

Methods: From a sample of 109 patients, 42 African American patients with family-level data were included. Cox proportional hazard models quantified associations between family-level predictors and DUP, and analyses controlled for effects of three previously determined patient-level predictors of DUP – mode of onset of psychosis, living with family members *versus* alone or with others, and living above *versus* below the federal poverty level.

Results: The median DUP was 24.5 weeks. Greater family strengths and a better family coping capacity were associated with a shorter DUP, whereas higher insight among informants and greater level of perceived caregiver strain were associated with a longer DUP.

Conclusions: Whereas family strengths and coping likely account for a significant portion of variability in DUP, both insight and caregiver strain probably evolve as a consequence of DUP. Efforts to strengthen families and tap into existing strengths of families in specific cultural groups would likely enhance early treatment-seeking for psychotic disorders.

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1. Introduction

Families are often crucial to the care and support of individuals with schizophrenia. Family members of people affected by this illness commonly provide a sense of security, offer support in a multitude of domains, and encourage treatment adherence. Families facilitate treatment-seeking, and are usually intimately involved in the process of initiating care for adolescents and young adults experiencing first-episode psychosis.

In relation to initiating care, duration of untreated psychosis (DUP) is widely recognized as a detrimental period of treatment delay deserving focused research attention. Generally defined as the time interval from the onset of positive symptoms to the initiation of adequate treatment (Compton et al., 2007a; McGlashan, 1999; Norman and Malla, 2001), DUP has been associated with poorer early-course outcomes in numerous studies (Marshall et al., 2005; Perkins et al., 2005). It is unclear whether DUP is causally associated with poorer outcomes through a biological “active morbid process” (Sheitman and Lieberman, 1998; Waddington et al., 1995) or through psychosocial mechanisms (Compton et al., 2008a; Norman et al., 2001), or if DUP serves rather as a marker of poorer outcomes (McGlashan, 2008). Nonetheless, given unnecessary burden imposed by untreated psychosis on affected individuals,

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families, and communities — beyond any potential adverse influence on early-course outcomes — efforts to reduce DUP clearly are warranted.

Promotion of early intervention may be facilitated by knowledge of the complex, multi-faceted determinants of DUP. Yet, relatively little research has focused on predictors of DUP, and evidence on how strongly and in what ways family factors influence DUP is largely lacking (Vaglum, 1996). Additionally, in light of extensive documentation of race-based disparities in both physical health (Dallas and Burton, 2004; Hogue, 2002; Oliver and Muntaner, 2005) and mental health (Das et al., 2006; Hines-Martin et al., 2003; U.S. Department of Health and Human Services, 2001), research involving particular ethnic minority groups, including African Americans, is seriously needed.

Despite the aforementioned relative dearth of research on family-level determinants of DUP, a number of preliminary studies are informative. The level of involvement of one's family in help-seeking may be associated with DUP (Chong et al., 2005; deHaan et al., 2002; McGorry et al., 1996; Morgan et al., 2006). Absence of a family history of psychosis or prior exposure to psychiatric illnesses (Chen et al., 2005; Norman et al., 2006; Schimmelmänn et al., 2007; Verdoux et al., 1998), lower levels of knowledge and awareness of mental illnesses (deHaan et al., 2002; Phillips et al., 1999; Tirupati et al., 2004), inclination to deny the existence of a mental illness (Johannessen et al., 2001; McGlashan, 1999), lower aptitude in tolerance and coping (Chong et al., 2005; Larsen et al., 1996; Yamazawa et al., 2004), and poorer family strengths (Goulding et al., 2008) may be potential determinants of DUP. Parental uncertainty over potentially symptomatic behaviors, self-reported caregiver burden, and the parents' view of their children as autonomous adults have been suggested as potential predictors of prolonged DUP (Bergner et al., 2008; Czuchta and McCay, 2001). Many of these studies report preliminary results, and most have not directly assessed family members who were actively involved in initiating care for first-episode patients. An understanding of family-level predictors of DUP is critical to promoting early intervention, but must be approached in a manner that does not blame families for delays in initial treatment-seeking.

DUP clearly is driven by patient- and illness-level factors in addition to family-level determinants. Previous research suggests that mode of onset of psychosis, or how quickly psychotic symptoms develop, is one of the best replicated illness-level predictors of DUP (Chen et al., 2005; Compton et al., 2008b; Kalla et al., 2002; Morgan et al., 2006). In a prior analysis involving the overall sample from the present study, two additional patient-level predictors were demonstrated when controlling for the effect of mode of onset of psychosis: living with family members prior to hospitalization and living below the federally defined poverty level (Compton et al., unpublished data).

This report presents data on the effects of six family-level variables, while controlling for the effects of mode of onset, living with family members *versus* alone or with others, and living above *versus* below the federal poverty level. Data on these hypothesized variables were gathered through a detailed clinical research assessment with a family member (herein also referred to as “informant”) who was actively involved in initiating care for the first-episode patient, in addition to the

standardized determination of DUP. It was hypothesized that a longer DUP would be predicted by family members' endorsement of: (1) less knowledge about schizophrenia, (2) greater perceptions of stigma held by most people toward individuals with mental illnesses, (3) lower levels of insight, (4) fewer family strengths, (5) more limited family coping capacity, and (6) lower levels of caregiver strain. These hypothesized predictors were generally exploratory (rather than being driven by convincing prior research) in light of the very limited research on family-level predictors of DUP. This analysis focuses on family-level predictors of DUP in African Americans specifically, the racial group of particular interest in the overarching study. Focused research in this area is critical given the above-mentioned health inequities affecting African Americans, in addition to the fact that little is known about the nature and extent of treatment delays for those who have psychotic illnesses in the African American community (Merritt-Davis and Keshavan, 2006).

2. Methods

2.1. Setting and sample

Patients with a first episode of nonaffective psychosis were recruited from three inpatient psychiatric units that serve patients with no insurance or with only public-sector insurance (e.g., Medicaid). These units care for a predominantly African American, low-income, and socially disadvantaged population. 281 patients were screened for study participation, though 89 were ineligible based on the following exclusion criteria: (1) age of <18 years or >40 years, (2) inability to speak English, (3) known mental retardation, (4) a Mini-Mental State Examination (Cockrell and Folstein, 1988; Folstein, 2001; Folstein et al., 1975) score of <23, (5) a significant medical condition compromising ability to participate, (6) prior antipsychotic treatment for >3 months, (7) previous hospitalization for psychosis >3 months prior to index hospitalization, and (8) inability to provide written informed consent. Among the 192 eligible patients, 83 refused participation or were discharged from the hospital before the in-depth research assessment could be conducted. The 83 eligible but not enrolled patients did not differ from the 109 eligible and participating patients in terms of age, gender, or race/ethnicity. Of the 109 participants in the overarching study, 44 (40.4%) referred an informant who then provided detailed data on a number of family-related variables. Because two Caucasian family members/informants were excluded to enhance homogeneity of the sample (given that the study focused primarily on African Americans), the present analyses included data from 42 African American patient-informant dyads.

Patients with and without informants assessed by the study (i.e., those included and not included in the present analyses) were compared with regard to 12 sociodemographic variables: age at hospitalization, gender, relationship status, years of education, history of being in special classes for learning or behavioral problems, living with family *versus* alone or with others, being raised by one *versus* two parents during most of childhood, whether or not the patient has any children, employment status in the month prior to hospitalization, religious affiliation, history of incarceration, and living above *versus* below the federal poverty level. The two

groups did not differ on any of these variables (all $p > 0.05$). Patients included and not included in the present analyses based on having or not having an assessed informant also were compared in terms of 14 clinical variables: hospital unit, voluntary versus involuntary legal status on admission, length of hospital stay, *Structured Clinical Interview for DSM-IV Axis I Disorders* (SCID; (First et al., 1998)) psychotic disorder diagnosis, SCID alcohol use disorder diagnosis, SCID cannabis use disorder diagnosis, *Positive and Negative Syndrome Scale* (PANSS; (Kay et al., 1987)) positive symptoms, PANSS negative symptoms, PANSS general psychopathology symptoms, age at onset of prodrome, duration of prodrome, age at onset of psychosis, DUP, and mode of onset of psychosis. The two groups differed only with respect to two of these clinical variables. Specifically, patients with a participating informant had a significantly longer hospital stay (median of 12.5 versus 9.0 days, $z = 2.12$, $p = 0.03$) and an earlier age at onset of psychosis (median of 20.0 versus 22.0 years, $z = 2.96$, $p = 0.003$) than those without a participating informant.

2.2. Procedures and measurement instruments

Participants were recruited between July 2004 and June 2008. Clinical research assessments with patients typically lasted about 4 h and were conducted once patients were adequately stabilized to allow for informed consent (mean \pm standard deviation and modal hospital days of assessment for all participants were 9.1 ± 6.7 and 7, respectively). The research assessment with informants lasted approximately 2 h and was conducted during the patient's hospitalization or, rarely, within several days of discharge. The study was approved by the university's institutional review board and the health system's research oversight committee, and all patients and informants gave written informed consent prior to enrollment.

Nonaffective psychotic disorders were diagnosed (and primary affective disorders excluded) using the psychotic and mood disorders modules of the SCID (First et al., 1998). The substance use disorders modules were administered to diagnose substance use disorders. As reported previously (Compton et al., 2006, 2008b) DUP was defined as the number of weeks from the onset of positive psychotic symptoms until first hospital admission, and was measured in a systematic manner using the *Symptom Onset in Schizophrenia* (SOS; (Perkins et al., 2000)) inventory, in addition to select items from the semi-structured *Course of Onset and Relapse Schedule/Topography of Psychotic Episode* (CORS/TOPE; (Norman and Malla, 2002)) interview. Onset of positive symptoms was operationalized as the date on which hallucinations or delusions met the threshold for a PANSS (Kay et al., 1987) score of ≥ 3 , and systematic methods were used to resolve difficulties in obtaining exact dates for the onset of psychotic symptoms. Cross-referencing with milestones and memorable events was used to enhance the accuracy of dating. A consensus-based best estimate of DUP was derived using all available information, including a thorough chart review, discussions with treating clinicians, the in-depth patient interview, and a detailed interview with informants.

Mode of onset of psychosis was categorized, based on all available information, using five subtypes put forth by the World Health Organization's International Pilot Study of

Schizophrenia: sudden, precipitous, subacute, gradual, and insidious (Jablensky et al., 1992). For the analysis, the first two of these modes of onset were combined into an "acute" category, the subacute mode was another category, and the latter two modes were combined into a "chronic" category. Data on a number of sociodemographic variables were gathered. Who the patient lived with prior to hospitalization was determined during the assessment of patient-level variables. Living above or below the federal poverty level was determined based on patients' reports of annual household income and the number of people living in the household, using published federal guidelines for the year in which the patient was assessed.

The first three hypothesized predictors — level of knowledge about schizophrenia, perceptions of stigma held by most people toward individuals with mental illnesses, and level of insight regarding the illness and need for treatment among family members — were measured with the *Knowledge about Schizophrenia Test* (KAST; (Compton et al., 2007b)), the *Devaluation and Discrimination* instrument (D&D; (Link et al., 1989, 1991)), and a modified version of the *Birchwood Insight Scale* (BIS; (Birchwood et al., 1994)). All three were administered to informants. The KAST is multiple-choice knowledge test, developed using accepted standards for multiple-choice item writing (Haladyna, 1999), that addresses the respondent's understanding of causes, symptoms, diagnosis, course, treatments, and self-help pertaining to schizophrenia. Studied previously in 441 participants from several samples (including lay community members, family members of inpatients with schizophrenia, police officers, and mental health professionals), item analysis, internal consistency reliability, and construct validity were demonstrated (Compton et al., 2007b). The 12-item D&D instrument assesses the extent to which respondents believe that most people devalue or discriminate against a person with a history of psychiatric treatment (Link et al., 1989, 1991). Items are measured with a 6-point Likert scale, with half of the items requiring reverse scoring. Individual items are summed before dividing by the number of answered items (usually 12), and higher scores indicate greater perceived stigma. The BIS, typically administered to patients, was modified in the present study for use with informants to assess their own level of insight. A self-report measure with eight items to which the participant responds "agree," "disagree," or "unsure," items are summed using a standardized method (Birchwood et al., 1994) for a total score, with higher scores indicating greater insight. To adapt the instrument for informants, wording of items was changed slightly (e.g., "My stay in the hospital is necessary" was changed to "My loved one's stay in the hospital is necessary"). Internal consistency coefficients for the KAST, D&D, and BIS in the present sample were $\alpha = 0.57$, $\alpha = 0.66$, and $\alpha = 0.58$, respectively.

The remaining three hypothesized predictors — the family's strengths, the family's coping capacity, and perceptions of the level of caregiver strain — were measured using total scores derived from the *Family Strengths* scale (FS; (Olson et al., 1985)), the *Family Crisis-Oriented Personal Evaluation Scales* (F-COPES; (McCubbin et al., 1982)), and the *Caregiver Strain Index* (CSI; (Robinson, 1983)). The FS is a reliable and valid 12-item instrument that utilizes a 5-point Likert scale to assess family resources (e.g., pride, accord) related to characteristics and dynamics that enable families to be resilient and

deal effectively with family problems (Olson, 2000; Olson and Gorall, 2003). The F-COPES is a psychometrically sound 30-item instrument scored on a 5-point Likert scale that measures family-level coping and problem-solving, as well as behavioral strategies employed during times of stress (e.g., acquiring social support, reframing, mobilizing the family to obtain and accept help). The F-COPES has been used with families of diverse backgrounds, including African American families (Corcoran and Fischer, 2000; Hanline and Daley, 1992; Myers et al., 1992). The CSI is a reliable and valid 13-item instrument measuring strain with regards to employment, financial, physical, social, and time domains for individuals assuming the role of caregiver for an adult family member. The CSI is appropriate for working-age adults across cultures, including African American adults (Corcoran and Fischer, 2000; Robinson, 1983). Internal consistency coefficients for the FS, F-COPES, and CSI in the present sample were $\alpha = 0.78$, $\alpha = 0.59$, and $\alpha = 0.87$, respectively.

2.3. Data analyses

Survival analysis (Collett, 2003; Marubini and Valsecchi, 1995) was employed to examine the association between “survival time” (onset of psychosis being the entry point and hospital admission being the end-point) and each continuous family-level variable. In light of prior research, all analyses controlled for the one relatively well established patient-level predictor of DUP, mode of onset of psychosis (Compton et al., 2008b; Morgan et al., 2006), as well as two other patient-level predictors determined previously in this sample, living with family versus alone or with others prior to admission, and living above versus below the federally defined poverty level (Compton et al., unpublished data). Cox proportional hazard models, which predict survival time from covariates (Collett, 2003; Marubini and Valsecchi, 1995) quantified associations between the family-level predictors and DUP while adjusting for the effects of the covariates.

3. Results

3.1. Sociodemographic and clinical characteristics of the patients

Sociodemographic characteristics of the 109 first-episode patients participating in the larger study have been reported previously (Compton et al., in press). Sociodemographic characteristics of the 42 patients with informant-level data included in this analysis are shown in Table 1. The mean age of patients at hospitalization was 22.1 ± 4.1 years. Nearly three-quarters (31, 73.8%) were male, and most (40, 95.2%) reported being single/never married. The majority (33, 78.6%) lived with family members during the month prior to hospitalization, and greater than half (26, 61.9%) were unemployed during that time. The mean level of educational attainment was 11.0 ± 2.1 years.

Select diagnostic and clinical characteristics are shown in Table 2. Over half of the patients (27, 64.3%) met the criteria for a diagnosis of schizophrenia, nine (21.4%) for schizophreniform disorder, three (7.2%) for schizoaffective disorder, two (4.8%) for psychotic disorder not otherwise specified, and one (2.4%) for brief psychotic disorder. Just over one-quarter (12, 28.6%) met the criteria for alcohol abuse or dependence,

Table 1

Sociodemographic characteristics of the patients ($n = 42$).

Age at hospitalization, years	22.1 \pm 4.1 (range: 18–39)
Gender	
Male	31 (73.8%)
Female	11 (26.2%)
Relationship status	
Single/never married	40 (95.2%)
Married or living with a partner	1 (2.4%)
Divorced	1 (2.4%)
Who the patient lived with in the month prior to hospitalization	
Family	33 (78.6%)
Alone or with others	9 (21.4%)
Employment status in the month prior to hospitalization	
Unemployed	26 (61.9%)
Employed	16 (38.1%)
Years of educational attainment	11.0 \pm 2.1 (range: 8–16)

while more than half (25, 59.5%) met the criteria for cannabis abuse or dependence. Most patients (36, 85.7%) were initially involuntarily hospitalized, and the mean length of hospital stay was 13.5 ± 6.9 days. The median, mean, and range values of DUP in the overall sample of 109 participants were 22.3, 67.5 ± 126.1 , and 0.0–839.3 weeks, respectively. In the sample of 42 patients described here, these values were 24.5, 87.1 ± 150.3 , and 0.0–839.0 weeks, respectively. As mentioned before, DUP did not differ between the overall sample and this smaller sample.

3.2. Sociodemographic characteristics of the informants

Sociodemographic characteristics of the 42 informants are shown in Table 3. The mean age was 46.3 ± 10.1 years. Thirty-nine (92.9%) were female, with 31 (73.8%) being the patients' mothers. Eighteen (42.9%) reported being married or living with a partner, just over half (25, 59.5%) were employed in the month prior to the patient's hospitalization, and their mean level of educational attainment was 12.8 ± 2.5 years.

Table 2

Select diagnostic and clinical characteristics of the patients ($n = 42$).

SCID nonaffective psychotic disorder diagnosis	
Schizophreniform disorder	9 (21.4%)
Schizophrenia	
Paranoid type	22 (52.4%)
Disorganized type	3 (7.1%)
Residual type	1 (2.4%)
Undifferentiated type	1 (2.4%)
Schizoaffective disorder	
Bipolar type	2 (4.8%)
Depressive type	1 (2.4%)
Brief psychotic disorder	1 (2.4%)
Psychotic disorder not otherwise specified	2 (4.8%)
SCID alcohol use disorders	
None	30 (71.4%)
Abuse or dependence	12 (28.6%)
SCID cannabis use disorders	
None	17 (40.5%)
Abuse or dependence	25 (59.5%)
Legal status at hospital admission	
Involuntary	36 (85.7%)
Voluntary	6 (14.3%)
Length of stay, days	13.5 \pm 6.9 (range: 2–35)

Table 3Sociodemographic characteristics of the informants ($n = 42$).

Age, years	46.3 ± 10.1 (range: 19–78)
Gender	
Male	3 (7.1%)
Female	39 (92.9%)
Relationship to patient	
Mother	31 (73.8%)
Father	3 (7.1%)
Sister	3 (7.1%)
Other (e.g., aunt, uncle, grandmother)	5 (12.0%)
Relationship status	
Single/never married	11 (26.2%)
Married or living with a partner	18 (42.9%)
Divorced/widowed/separated	13 (30.9%)
Employment status in the month prior to the patient's hospitalization	
Unemployed	17 (40.5%)
Employed	25 (59.5%)
Years of educational attainment	12.8 ± 2.5 (range: 8–18)
How often the informant saw the patient during the year prior to hospitalization	
At least daily	29 (69.0%)
About every other day	6 (14.3%)
At least weekly	7 (16.7%)

More than half (29, 69.0%) reported seeing the patient on at least a daily basis during the year prior to hospitalization.

3.3. Family-level predictors of DUP

As shown in Table 4, four independent variables were significantly associated with DUP in their respective models that adjusted for the effects of the three patient/illness-related determinants. A higher level of insight among informants was associated with a longer DUP ($HR = 0.74$; Wald $\chi^2 = 4.52$, $p = 0.03$). The two family functioning variables were significantly inversely correlated with DUP. Specifically, greater family strengths and a higher level of family coping capacity were associated with a shorter DUP ($HR = 1.07$; Wald $\chi^2 = 4.90$, $p = 0.03$, and $HR = 1.06$; Wald $\chi^2 = 4.33$, $p = 0.04$, respectively). A greater perception of the level of caregiver strain was associated with a longer DUP ($HR = 0.90$; Wald

Table 4

Family-level predictors/correlates of DUP, based on Cox proportional hazard models, each controlling for the effects of three patient/illness-level predictors*.

Variable	Parameter estimate	Standard error	Wald χ^2	p
Informant's level of knowledge about schizophrenia	0.021	0.096	0.05	0.83
Informant's perceptions of stigma held by most people	−0.002	0.034	0.00	0.95
Informant's level of insight	−0.297	0.140	4.52	0.03
Family's strengths as rated by the informant	0.068	0.031	4.90	0.03
Family's coping capacity as rated by the informant	0.055	0.027	4.33	0.04
Informant's perceptions of level of caregiver strain	−0.105	0.051	4.19	0.04

*The mode of onset of psychosis (acute, subacute, or chronic), living with family versus alone or with others prior to hospitalization, and living above versus below the federally defined poverty level (Compton et al., unpublished data).

$\chi^2 = 4.19$, $p = 0.04$). However, two of the six hypothesized informant-level predictors — level of knowledge about schizophrenia and perceptions of stigma held by most people toward individuals with mental illnesses — were not predictive of the patient's DUP when controlling for the effects of the three patient-level determinants (mode of onset of psychosis, living with family versus alone or with others prior to admission, and living above versus below the federally defined poverty level).

4. Discussion

Several novel findings emerged from this analysis of family-level predictors of DUP in a sample of African American first-episode patients and their family members who were actively involved in initiating care for them. First, as hypothesized, family functioning, indicated by both family strengths and the family's coping capacity, was predictive of DUP when controlling for the three patient/illness-level factors, such that better family functioning was associated with a shorter treatment delay. Second, a higher level of insight among informants and a greater level of perceived caregiver strain were associated with a longer DUP when adjusting for the effects of the three covariates — opposite the hypothesized relation. Third, contrary to the hypothesized associations, the informant's level of knowledge about schizophrenia and the informant's perceptions of stigma held by most people toward individuals with mental illnesses were not significant determinants.

The findings indicating that both family strengths and family coping capacity are inversely related to DUP clarify the relationship already suggested in prior preliminary investigations of these highly relevant family variables (Chong et al., 2005; Goulding et al., 2008; Larsen et al., 1996; Yamazawa et al., 2004). Family functioning is a potentially fruitful area for future research and interventions that target the reduction of treatment delay. Given that relatives of African Americans often are involved in the initiation of treatment for a first episode of psychosis (Compton et al., 2006), additional research seeking to replicate these findings would benefit interventions aiming to cultivate family resources (e.g., fostering stronger pride and accord) and behavioral strategies (e.g., developing helpful coping skills). Strengthening and supporting families would help them to become more adept at acquiring and accepting the appropriate health care services for family members in need of evaluation and treatment.

The finding that a higher level of insight among informants was associated with a longer DUP was unexpected and may be related to the construct measured by the modified BIS that was used. Specifically, the questionnaire assesses insight regarding both the illness and the need for treatment, constructs that may not coincide. Informants may have acknowledged that their loved one was suffering from a mental illness (e.g., disagreeing with items such as, "My loved one is mentally well"), while at the same time denying the need for treatment (e.g., disagreeing with items such as, "The doctor is right in prescribing medication for my loved one"). Furthermore, this response pattern may be more characteristic of informants whose loved ones have experienced psychosis for a longer period of time. In these situations, family members are more certain that a mental illness exists

but may have adapted to the presence of psychotic symptoms and implemented alternative explanations or help resources as a means of coping with the behaviors, thereby viewing medical treatment as ineffective or less necessary. This possibility seems more plausible when considering previous research documenting the tendency for African Americans to avoid psychiatric medication use, even when the medications are prescribed to treat a known mental illness (Schnittker, 2003).

The results demonstrating that greater insight and greater perceptions of caregiver strain were associated with longer DUP also may suggest that these two variables are not antecedents of DUP, but rather are consequences of DUP. That is, whereas family strengths and family coping probably tap the family's functioning in general – before, during, and after DUP – both insight and caregiver strain likely evolve as a consequence of DUP. Thus, there may be greater awareness of need for treatment and greater caregiver burden as the early illness progresses.

There are several potential explanations for the lack of association between two of the hypothesized predictors and DUP. First, measures used in the present study may not adequately assess these two complex constructs – knowledge about schizophrenia and stigma – or there may be insufficient variability in the measures used. Second, among the numerous potential family-level determinants of DUP, knowledge about schizophrenia and perceived stigma may have little to do with decisions about when to seek treatment. Third, it could be that the multitude of other factors, many of which may be more robust predictors, override any apparent effects of knowledge and perceived stigma. Greater understanding of these seemingly logical predictors of DUP would be enhanced with more thorough assessments of knowledge about schizophrenia, beliefs about its causes, and attitudes about mental health treatments, as well as more comprehensive measurement of the various facets of stigma, including felt stigma and self stigma. Furthermore, the relations between knowledge and insight among family members involved in initial treatment-seeking would be useful to explore.

Treatment delay is associated with caregiver burden as well as adverse clinical features in patients. Taken together, the findings highlight the fact that social and public policies designed to ameliorate poverty and strengthen poorly functioning families would be beneficial for first-episode patients and their families. Diverse patient-, family-, and service-level factors are clearly at play in determining the duration of initial treatment delay. Only several key family-level variables were considered herein. Diverse other factors, including the identified patient's decision-making (e.g., acceptance or refusal of initial treatment-seeking attempts) clearly are involved and could potentially influence both DUP and family-level factors such as perceived burden.

Understanding family-level correlates of treatment-seeking for new-onset psychosis among African Americans seems particularly critical given the unique value often placed on the family within this cultural group. For instance, Markus and Kitayama (1991) delineated independent and inter-dependent self-construal to describe an individual's view of self in relation to others. In general, this work suggests that inter-dependent self-construal, characterized by an emphasis on collective well-being, greater influence of others on personal

emotions, and a focus on interpersonal harmony, is typical of African-descendent cultural groups. Further, research comparing African American family life to that of other ethnic groups has pointed to the significance of strong family ties, reliance on extended family members for support, and non-medical sources of mental health treatment such as informal support networks and ministers (Boyd-Franklin, 2003; Hines and Boyd-Franklin, 1996; McAdoo, 2002; Stevenson and Renard, 1993). The importance of extended family members is associated with a level of role flexibility that is apparent in African American families, particularly in times of crisis such as hospitalization. For example, grandmothers, aunts, and family friends may fulfill roles typically filled by parents in families of other cultural groups (Hines and Boyd-Franklin, 1996). In addition, although emphasis on spirituality is often viewed as a cultural strength, researchers note that families may “spiritualize” emotional problems such as psychosis. In effect, these problems are seen as “God's will” or a sign that the patient is “possessed by the devil” (Hines and Boyd-Franklin, 1996). A better understanding of the qualities and strengths of African American families would likely improve treatment adherence and success as well as expediency of treatment-seeking, both noted problems for this population. In particular, African Americans have been documented to have lower levels of mental health treatment utilization, lower quality of mental health care (Lowe, 2006), greater unmet need for a variety of mental health conditions (Wells et al., 2001), and lack of access to insurance coverage (Hines-Martin et al., 2003).

Several methodological limitations of this study must be acknowledged. First, given the unique sociodemographic characteristics of the sample, caution is warranted in generalizing the present findings to dissimilar populations; however, sample homogeneity enhances internal validity of the findings. Second, the limited sample size obviously constrains power to detect meaningful associations. Yet, to the authors' knowledge, this is the only study to date that quantitatively addresses family-level predictors of DUP using direct measurements obtained from family members actively involved in initiating the patient's care, and clearly the only study to do so in an African American sample. Third, differences between patients who participated in the overarching study ($n=109$) and those who were eligible but refused (or were discharged from the hospital before the assessment could be conducted) may have introduced selection biases. Although these two groups did not differ in terms of age, gender, or race/ethnicity, they could not be compared on other sociodemographic and clinical variables given that such data could not be collected from non-participants. Fourth, differences between patients with and without informants may have introduced significant selection biases. However, when compared on 26 sociodemographic and clinical variables, patients with a participating family member/informant were different from those without informants only in terms of having a longer hospital stay and an earlier age at onset of psychosis. Fifth, the internal consistency reliability coefficients for the rating scales used to assess the six key variables ranged from $\alpha=0.56$ to $\alpha=0.87$, and some of these values are lower than preferred. Nonetheless, the limitations of internal consistency coefficients are widely recognized (e.g., values are partly dependent on the

number of items in the instrument, and overly high values may indicate a high level of item redundancy). Furthermore, internal consistency may have been artificially lowered due to the *a priori* analytic decision to use total scale scores rather than subscale scores, in an effort to minimize the number of hypothesis tests conducted given the limited sample size. Sixth, due to the limited variability in informant type (i.e., 74% were mothers) and the resulting small sample sizes for other informant types, differences (e.g., in perceptions of caregiver strain) across types of informants could not be determined. Further, potential differences between informants who had social support and those who did not could not be ascertained. Future research may benefit from a more detailed study of family members given the importance of their own characteristics in the context of family-initiated help-seeking.

In 1996, Per Vaglum noted that *...Without doubt, the family plays an important role in the treatment-seeking and treatment-receiving process of psychotic patients, but we have no clear evidence as to how strongly and in what ways they influence DUP...To help families detect possible signs of psychosis early and establish adequate help early, we need to know what the problems are on a family level. An early intervention program should also focus on how families tend to cope with their prodromal or manifest psychotic members in accordance with family traditions...* (page 350). The present study was driven by that admonition; though, unfortunately, very little other research has been conducted on predictors, particularly family-level predictors, of treatment delay and DUP. The present findings suggest that family-level factors (e.g., family functioning), are predictive of DUP, and that other family-level factors (e.g., caregiver strain) may be adversely affected by DUP. Just as early detection and intervention services seek to engage families in treatment (Gleeson et al., 1999; McFarlane, 2001, 2004), early psychosis research should include diverse family-level variables, in a way that minimizes blame and optimizes partnership and engagement, in studies of initial treatment-seeking.

Role of funding source

This research was funded by National Institute of Mental Health grant K23 MH067589. The funding source had no role in the analyses or the writing of this article.

Contributors

Michael T. Compton designed and managed the study and oversaw the writing of the report. Paul S. Weiss advised on, conducted, and interpreted the statistical analyses. All authors contributed substantially to the writing of the article and approved the final version.

Conflicts of interest

The authors know of no conflicts of interest pertaining to this article.

Acknowledgments

This research was supported by National Institute of Mental Health grant K23 MH067589 to the first author. The authors gratefully acknowledge Michelle Esterberg, Tandra Carter, Amy Leiner, Erin Bergner, Beth Broussard, Victoria Chien, Lauren Franz, Tarianna Stewart, Kevin Tessner, and Hanan Trotman.

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