Correlates of attendance in mental health services for individuals with psychotic disorders:

A critical review

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Abstract

Purpose: Low attendance to mental health care results in loss of time, money, and treatment gains. No prior review in this area has taken into account the quality of studies or varying definitions of attendance. The current review provides a critical evaluation of variables associated with attendance in consumers with psychotic symptoms participating in outpatient mental health services, with a focus on study quality and operationalization of attendance. Methods: EMBASE, MEDLINE, PsycINFO, CINAHL, and the Cochrane Library were searched for empirical articles relevant to attendance to mental health services by individuals diagnosed with a psychotic disorder. Eligible articles were rated for quality by two co-authors; high-quality articles were reviewed in-depth. Results: Twenty-eight articles were eligible; eleven articles qualified for in-depth review. Four attendance outcome types were identified, including the prediction of dropout, time engaged, categorical attendance, and continuous attendance. Ongoing substance use during treatment was consistently associated with lower attendance in high-quality articles. Conclusions: More high quality research using systematically defined outcome types is needed to identify reliable associations with attendance. Commonly tested variables such as demographics show little utility in predicting attendance. Future research in this area should expand upon current findings focusing on clinically and theoretically relevant variables.

Keywords: attendance, mental illness, psychotic disorders, dropout

Introduction

Attendance and dropout are concerning problems in the mental health field. Dropout rates are high in mental health services; a seminal meta-analysis on outpatient psychotherapy dropout found an average dropout rate of 47% (Wierzbicki & Pekarik, 1993). While variable, dropout rates appear high among outpatients with psychotic disorders, ranging from 17% to 64% (Dworkin, Adams, & Telschow, 1986; Ucok et al., 2007). A recent review of attendance to services for individuals with first-episode psychosis found an average dropout rate across 10 studies of about 30% (Doyle et al., 2014). With such high dropout rates, mental health agencies lose money and resources invested in missed appointments and under-attended groups, providers lose valuable time, and consumers do not receive recommended levels of services. Further, for consumers with psychotic diagnoses, leaving services prematurely can lead to worse long-term outcomes (Beard, Malamud, & Rossman, 1978; Pekarik, 1985).

Due to the important impact of dropout and attendance, a plethora of research has been conducted investigating contributing factors; several attempts have been made to review and summarize this literature, with varying target populations and review methodologies. A recent review of dropout from mental health treatment for schizophrenia identified age, sex, minority background, and social functioning as consistent correlates of attendance (Kreyenbuhl, Nossel, & Dixon, 2009). Another review indicated age, ethnicity, insight, substance misuse, forensic history, and characteristics of the services provided as factors associated with disengagement from treatment (O'Brien, Fahmy, & Singh, 2009). However, at times, the conclusions drawn within these reviews are not universally supported by the literature. For instance, in a review conducted by Nose, Barbui, and Tansella (2003), the most supported contributing factor to non-adherence (defined both as attending services and taking prescribed medications) was increased psychopathology, which was significantly associated with non-adherence in only 15 studies out of the 86 studies reviewed; moreover, *decreased* psychopathology was significantly associated with adherence in a further 6 studies.

The review by Nose et al. (2003) also highlights a key difficulty regarding the state of knowledge explaining dropout and attendance in mental health services, namely, the abundance of variables typically

examined. Their review found 23 different predictors to be associated (in at least four studies) with

adherence. Mitchell and Selmes (Mitchell & Selmes, 2007) also speak to this conundrum. In their review

of attendance in psychiatry, they highlighted several additional areas which can impact engagement,

including perceived benefits of care, perceived costs of care, barriers to care, doctor-patient factors,

illness factors, and cues to act.

Another empirical challenge involves the differing ways attendance has been operationalized. As

Mitchell and Selmes (2007) note, attendance is often not measured in a nuanced fashion, but evidence

indicates there may be distinctions in what predicts attendance for patients at varied levels of engagement

(e.g., disengaged, low attendance, good attendance, etc.). O'Brien and colleagues (2009) discussed the

difficulty in defining disengagement in general, and that terminology is often used interchangeably (such

as attendance and engagement) when there may be important nuanced differences in what these terms

imply; this issue is also of concern in the growing literature on treatment for first-episode psychosis

(Doyle et al., 2014). Nose et al. (2003) acknowledged that they chose not to assess how adherence was

measured in their review, in part because "the majority of included studies did not explicitly state how

adherence was measured" (pg. 1154). The frequency or proportion of appointments kept is theoretically

and clinically different than whether or not someone has completely dropped out of services (e.g., see

McGuire, Bonfils, Kukla, Myers, & Salyers, 2013). Despite these meaningful differences, reviews often

conflate these outcome variables, thereby potentially obscuring contributing factors to each outcome.

Another key issue is the quality of studies investigating correlates of attendance. Many studies are

underpowered to find even medium effect sizes (Lipsey, 1990), raising the likelihood of Type II error.

Sample procedures can also greatly affect the generalizability of results. For instance, focusing on

consumers who attend appointments (as opposed to those who have already dropped out) misses a crucial

sample in attendance studies. Past reviews have not taken into account the varying quality of these

articles (e.g., see Kreyenbuhl et al., 2009; Nose et al., 2003; O'Brien et al., 2009).

Although attendance has been extensively studied, and several reviews have been published, no

review has yet taken into account the quality of reviewed studies or the varying definitions of attendance.

The current review therefore aims to build upon the work of previous reviews such as that by O'Brien and colleagues (2009) to provide a critical systematic review of the literature on variables associated with attendance in consumers with psychotic symptoms participating in general outpatient mental health services. We sought to answer the following questions: 1) how is attendance defined within the literature? 2) What is the quality of the literature on attendance, and how should this color our interpretations? 3) Finally, in light of answers to our first two questions, are there factors in the literature that are consistently correlated with attendance?

Methods

In June of 2012, EMBASE, MEDLINE, PsycINFO, CINAHL, and the Cochrane Library were searched for relevant articles using combinations of the following keywords: group, therapy, psychosocial, treatment, mental disorder, mental illness, schizophrenia, bipolar disorder, depression, predictors, determinants, attendance, adherence, compliance, appointment, participation, persistence, service intensity, attrition, termination, dropout, exposure, and engagement. The literature search was updated in February of 2014. Due to variance in terminology used in this area, an iterative process of identifying search terms was conducted when we identified an article that used terminology differing from our keywords, resulting in a large number of search terms. See *Figure 1* for a flow chart of article identification. See the online Appendix for a list of excluded studies. We attribute the large number of articles identified only through references as opposed to literature searches to the lack of consistency in terminology used throughout this field.

Inclusion criteria included peer-reviewed publications focusing on attendance to outpatient mental health services, with psychotic disorders as the most prevalent diagnostic group. This was operationalized as at least 50% of the sample. If a study did not report mental health diagnoses included in the sample(s), it was not eligible for inclusion in this review; this was to enable conclusions to be drawn as to the nature of attendance in a more specific population. We did not include publications with samples comprised of or including inpatients due to the inherently different nature of attendance to psychosocial services in this population. For a similar reason, publications only examining self-help

groups, focusing only on a specific program (such as Assertive Community Treatment, which specifically targets engagement in services) or examining adherence to treatment referrals were not included. Additionally, in order to increase validity of findings, we did not include articles in which the attendance outcome was limited to a holistic, non-empirically derived assessment of attendance. See *Figure 1* for the number of articles excluded sorted by exclusion category. Finally, we did not include studies examining only medication adherence with no attendance component.

The first author assessed titles, abstracts, and sample composition, excluding publications that did not meet inclusion criteria. Twenty-seven publications met inclusion criteria; see Table 1 for included studies. We included 1 additional article for a total of 28 total publications. This additional article (Cruz & Cruz, 2001) was previously known to the authors but did not appear in any of our literature searches or reference sections. Broadening our search in an attempt to include this article resulted in unbearably large returns (e.g., for one search, 30,265 hits in EMBASE), and a prospective search of articles citing this work yielded no additional eligible articles. We therefore concluded that this article, while relevant, did not represent a systematically excluded set of articles using particular terms.

Each article was read by at least two co-authors, each pair including one clinical psychologist and either a doctoral level clinical psychology student or undergraduate research assistant. Relevant data was extracted from the articles, with discrepancies resolved in consensus meetings. Each analysis was categorized by quality and outcome type. Quality was rated using similar methodology to that described by Mukoro (2012) in a review of the Patient Activation Measure (see Table 2 for our modified rating scheme). We modified the quality rating system in two main ways. First, we altered categories of quality to fit literature in this area, but utilized the same scheme to rate the overall quality of a given study. Second, we opted to rate confidence in study findings as opposed to risk of bias in order to clearly demonstrate our use of the quality ratings. We had high confidence in findings of studies that were rated optimum in five out of seven quality domains and did not have any ratings of least valuable. Studies in which we had moderate confidence had five or fewer ratings of optimum quality and one or fewer ratings

of least valuable. We had low confidence in study findings if a study had more than one least valuable

rating.

Results

See Table 1 for a list of reviewed studies with brief descriptions. Studies covered a wide range of

publication dates, services, locations, and outcome variables. Study publication dates ranged from 1977

to 2013, but the majority occurred in the 1990s or later (n = 22, 78.5%). Services included therapy,

medication checks, early psychosis services, general outpatient services, day hospital programs, and

psychosocial rehabilitation services. Eleven studies took place in the United States, with others taking

place in Canada, the United Kingdom, Australia, Singapore, China, India, Turkey, Nigeria, and New

Zealand.

Quality of Studies

See Table 3 for quality ratings of each study using our quality rating metric. Eleven studies

(39.3%) met criteria for high confidence, 16 (57.1%) for moderate conference, and just 1 (3.6%) for low

confidence. Eight out of eleven studies rated as high confidence had been conducted since 2006, and all

had been conducted since 1993; no other discernible patterns affecting quality arose when looking across

studies. When looking at individual categories in the quality rating scheme, studies most often failed to

achieve optimum ratings in the *Sampling and Sample* (22 studies rated adequate or least valuable) and

Operationalized dropout/attendance terms (15 studies rated adequate or least valuable) categories.

How is Attendance Defined?

The operationalization of "attendance" varied widely across studies, but fell into four general

categories. Eight studies predicted *dropout*; these studies categorized participants as dropouts (yes or no),

with "dropout" defined as leaving services and not returning before the end of the observation period

and/or before clinically indicated. Relatedly, five studies predicted *time engaged*—i.e., the time a

participant stayed in services before dropping out. *Attendance (categorical)* (14 studies) involved

categorizing participants into groups of varying levels of participation in services, generally

operationalized based on number or percent of services attended. Finally, three studies measured

attendance (continuous) based on the number or percent of sessions attended, or examined the differences between those attending an index appointment. Two studies (Stowkowy, Addington, Liu, Hollowell, & Addington, 2012; Ucok et al., 2007) assessed two different types of attendance outcome. It should be noted that while all studies were categorized by outcome type based on the operationalization provided, some studies presented clearer information that others, and, as can be noted in the quality ratings, not all studies were rated as "optimum" for operationalizing their attendance terms. While no study received a quality rating of "least valuable" for the *Operationalized attendance/dropout terms* category, 15 studies received a rating of "adequate" (see Table 3).

Although we have not ranked the type of attendance outcomes in value, studies measuring *attendance (continuous)* capture the most variance in outcome, thereby providing more power for subsequent analyses. Interestingly, the three studies using this outcome type in our review (Bender & Koshy, 1991; Brekke, Ansel, Long, Slade, & Weinstein, 1999; Cruz & Cruz, 2001) were found to be of moderate quality overall, due to deficiencies in sampling or sample description. The two studies which assessed two different outcomes were both rated as high quality, for a total of 13 separate high quality outcomes. Of high-quality studies, four examined *time engaged* (Conus et al., 2010; Schimmelman, Conus, Schacht, McGorry, & Lambert, 2006; Stowkowy et al., 2012; Ucok et al., 2007)*,* six examined *attendance (categorical)* (Adelufosi, Ogunwale, Adeponle, & Abayomi, 2013; Adeponle, Thombs, Adelekan, & Kirmayer, 2009; Carrion, Swann, Keller-Cecil, & Barber, 1993; Sparr, Moffitt, & Ward, 1993; Stowkowy et al., 2012; Svettini et al., 1998)*,* and three examined *dropout* (Kurtz, Rose, & Wexler, 2011; Turner, Smith-Hamel, & Mulder, 2007; Ucok et al., 2007).

Correlates of Attendance

Because our aim with this review was to provide clarity to the field, we chose to include only high quality studies in our examination of correlates and predictors of attendance and/or dropout. See Table 4 for a listing of variables tested for an association with attendance in the eleven high-quality studies. Variables generally fell into the following eight categories: demographics, symptoms/illness,

functioning, psychiatric history, cognition, social support, medications, treatment variables, and substance use.

Across the eleven high-quality studies, demographic variables were most commonly studied. However, few of these variables exhibited consistent associations with attendance. Distance from the service site was found to be significant in two studies in Nigeria, but has yet to be tested in most other cultures. Other common demographic variables such as age, race, sex, and education seem not to predict attendance across the outcome types studied. Cost of treatment may have a meaningful association with attendance, but has not yet been studied enough for consistent patterns to emerge in a given country.

Symptom or illness variables were also investigated frequently, but positive and negative symptoms seem to be of little utility in the prediction of attendance. Greater overall symptom severity is associated with poorer attendance in half of the eight high quality studies which investigated it; however, one other high quality study (Turner et al., 2007) found the opposite relationship. Similarly, diagnosis seems to have a complex relationship with attendance. Three studies (Conus et al., 2010; Schimmelman et al., 2006; Stowkowy et al., 2012) found a significant (or trending) association between psychotic disorder not otherwise specified (as compared to schizophrenia) and poor attendance. A fourth study (Adeponle et al., 2009) found substance use diagnoses to be associated with poor attendance; this is consistent with the finding that continued substance use during treatment leads to poorer attendance (Conus et al., 2010; Schimmelman et al., 2006; Stowkowy et al., 2012; Turner et al., 2007), which was supported by all four studies investigating this variable. Other more varied results also emerged, indicating mood disorder diagnoses may be associated with better attendance (Turner et al., 2007), as may be schizophrenia (Svettini et al., 1998) and diagnoses other than PTSD (Sparr et al., 1993). Although it is frequently researched, it would seem that diagnosis has a complex relationship with attendance.

Functioning variables (i.e., premorbid and baseline functioning, employment) were not frequently investigated, and thus few conclusions can be drawn regarding their utility. Of the functioning variables found in the eleven high-quality studies, employment seems to communicate the clearest findings: that it has little utility in predicting attendance. Although unemployment predicted less attendance in one study

(Conus et al., 2010), six others found it to be non-significant. Further, psychiatric history variables at

large were not often associated with attendance, although some of these variables were examined just

once. Similarly, cognition, social support, and medication variables appear to be under-studied, enabling

few conclusions to be drawn. However, one variable that seems particularly promising is family

involvement in treatment, which was found to have a significant positive association with attendance by

both analyses in which it was included (Adeponle et al., 2009; Stowkowy et al., 2012). Treatment-related

variables were infrequently examined in investigations of attendance; each variable in this category was

examined only once. All variables but one (length of time to appointment) were found significant in the

one study examining them.

Correlates of attendance and outcome types

No clear patterns emerged regarding outcome type; this may be due to the small samples of each

type included in our analyses. However, the two studies utilizing multiple outcome types did have slight

differences in findings for the different analyses. Stowkowy et al. (2012) investigated attendance both

using time engaged and dropout. They first looked at predictors and how they differed between four

groups with increasing lengths of follow-up. They then looked at the same predictors and whether

participants had disengaged from services or not (dropped out). Although most of the variables

significant in the first analysis were significant in the second (family member in program and drug use

during treatment), some were not (duration of untreated psychosis, cannabis use). Further, some

additional associations came to light (negative symptoms, general psychopathology). Ucok et al. (2007)

also utilized multiple outcome types and came up with slightly different results. When examining

variables between those who continued in treatment and those who dropped out, they found education,

age of onset, having national healthcare coverage (cost of treatment), complying with medications, and

attending a specialized clinic all associated with attendance. When examining the same variables with the

duration of follow-up, only age of onset remained significant. A further association came to light with

this method, as well (suspiciousness). Although our data did not give much opportunity for comparing

outcome types, these two studies clearly show that how attendance is measured can affect results.

Discussion

Despite the large number of studies exploring correlates of attendance, only eleven studies were deemed high quality. Across all studies, attendance outcomes varied, but seemed to fall into four discernable categories: prediction of dropout, time engaged in services, attendance (categorically defined), and attendance (continuously measured). These differing operationalizations of attendance tap into related, yet distinct constructs. Moreover, evidence from studies including multiple outcome types (Stowkowy et al., 2012; Ucok et al., 2007) supports the notion that differing attendance outcomes are affected by different variables. Regarding correlates of attendance, review of high quality studies revealed that ongoing substance use is consistently associated with decreased attendance. Further, demographic variables (i.e., age, sex, race, marital status, education) and employment have consistently shown no relationship with attendance.

A unique contribution of this review over prior literature (e.g., see Kreyenbuhl et al., 2009; Nose et al., 2003; O'Brien et al., 2009) is the use of quality ratings of included studies. Only one study was considered low quality, but less than half (39%) of reviewed articles were considered high quality. Studies most often were sub-optimal in their sampling procedures or sample size (*Sampling and Sample* in Table 2), indicating results may not be generalizable, and/or samples may not be large enough for adequately powered statistical analyses. This is of particular concern when trying to ascertain patterns of significant findings – it is possible that with larger samples numerous predictors may have a more solid evidence base. Studies also frequently did not clearly operationalize their attendance terms (*Operationalized dropout/attendance terms* in Table 2), making it difficult first for readers to understand exactly what is being measured, and second, for researchers to replicate the research design. As has been discussed before (Doyle et al., 2014; Mitchell & Selmes, 2007; Nose et al., 2003; O'Brien et al., 2009), this issue runs rampant in the attendance literature, and presents a barrier to furthering this research in a replicable, robust manner.

Because of our use of quality ratings, we were able to narrow the reviewed studies to only those of high quality for an in-depth examination of correlates of attendance. Not surprisingly, few variables

emerged as having clear, consistent relationships (i.e., ongoing substance use). This finding echoed that of a recent review of the attendance literature in first-episode psychosis, in which substance use was the most robust predictor of dropout, and demographic variables were of little value (Doyle et al., 2014). In the current review, diagnosis also seems to be of some utility, in that multiple studies found those diagnosed with psychosis not otherwise specified (as compared to schizophrenia) tend to have poorer attendance. It may be that this group of individuals less often receive empirically supported treatment, leading to a negative treatment experience whereby they feel they are not being helped as much as others with more defined diagnoses. Alternatively, these consumers may feel they need less help, and thus disengage earlier. However, several other studies found different, varied relationships between diagnosis and attendance, indicating this variable may be more specific to service setting and is therefore limited in generalizability. Given that not all diagnostic groups were tested in each high quality study (for example, schizophrenia spectrum diagnoses may have been investigated in one study while subtypes may have been broken out in another), and that use of the subtypes has been discontinued in the Diagnostic and Statistical Manual, 5th Edition (American Psychiatric Association, 2013), future research may instead choose to focus on specific symptoms in a more nuanced way, such as with the five-factor solution to the Positive and Negative Syndrome Scale (Kay, Fiszbein, & Opler, 1987), as was used by Kurtz and colleagues (2011).

As a result of the paucity of high quality studies available and the diverse variables tested across studies, numerous variables have not yet been studied enough to draw firm conclusions, although some show promise. Treatment-related variables were gravely understudied but often significant (in single studies), indicating this may be an important area for future research. Some of these variables are also largely driven by consumers (i.e., satisfaction, past history of missed appointments), indicating they could be particularly salient predictors of future attendance patterns and key areas for interventions to increase attendance. Another understudied variable, family involvement in treatment, predicted better attendance in both studies which examined it; this is consistent with past reviews (Doyle et al., 2014; O'Brien et al., 2009), and points to social support as an important place for future study and potential intervention.

Other variables, such as those related to cognition and medication, were not studied enough to enable conclusions to be drawn, and should be examined in future studies.

Further, some variables may be a product of the location of the study examining attendance. Almost a third of the studies included in this review (n = 9) were conducted in what are considered "developing" countries according to the International Monetary Fund (e.g., Nigeria, India, Turkey, China; International Monetary Fund, 2012). Of these studies, three were deemed to be of high quality, and thus make up a good portion of studies reviewed herein. As there are differences in how mental health care is provided between developing and developed countries, it makes sense that different variables may affect attendance (e.g., see Gureje & Lasebikan, 2006). Some specific variables which may be different include living arrangements, costs of treatment, and distance from service site. Specifically, distance from service site was found significant twice in Nigeria, but was not tested in any developed nations. In general, many developing nations have more centralized healthcare. This may result in increased difficulty reaching treatment centers and obtaining consistent funding for treatment, which, in turn, may contribute to lower attendance rates. There may also be more stigma and mysticism surrounding mental illness in developing countries than developed countries (e.g., see Kabir, Iliyasu, Abubakar, & Aliyu, 2004), but these variables were not tested by high quality studies in developing nations in our sample. Stigma pertaining to mental illness and its potential causes can be major obstacles to successful treatment in developing nations. Several studies in developing countries have shown prevalent perceptions of mental illness as developing from supernatural causes (Razali, Khan, & Hasanah, 1996; Srinivasan & Thara, 2001) and that those with mental illness are socially undesirable (Gureje, Lasebikan, Ephraim-Oluwanuga, Olley, & Kola, 2005; Lauber & Rössler, 2007). Future studies may further investigate differences between developing and developed nations regarding attendance to mental health treatment in relation to costs of treatment, distances to treatment centers, living arrangements, as well as stigma and various cultural supernatural perceptions.

With few consistent relationships emerging from this review, what became clear was that numerous variables that are frequently studied seem to be of little utility (i.e., demographics). Though

some past evidence has supported this finding (e.g., see Çakır, İlnem, & Yener, 2010), this assertion is in direct contradiction to several previous reviews (Kreyenbuhl et al., 2009; Nose et al., 2003; O'Brien et al., 2009) which cited such variables as sex, age, and ethnicity as consistent in their associations with attendance. As Nose et al. (2003) acknowledged, past reviews have not assessed quality or outcome type when drawing conclusions based on the literature, likely contributing to the differing findings with regard to demographic variables. Inclusion of studies with non-representative or small samples, poorly defined attendance terms, insufficient background information, and subpar data collection methods could all serve to obscure existing associations and/or promote false associations with attendance in the literature.

In this vein, an improvement in this review over others is the examination of outcome types. Four differently operationalized outcome varieties were discernible among reviewed studies, including the prediction of dropout, time engaged in services, attendance (categorically defined), and attendance (continuously measured). Half of studies reviewed chose to categorically define attendance, which artificially (and sometimes arbitrarily) restricts the variance, taking power away from statistical analyses (Lipsey, 1990). Of particular interest, two reviewed studies included multiple outcome types (Stowkowy et al., 2012; Ucok et al., 2007), and both found slightly different results in the separate analyses. This highlights the incredible importance of our choices in how to measure attendance, and points to the need for more studies to include varied outcome types across which correlates can be compared. Further, considering that the operationalization of attendance has a clear effect on analyses, outcome types should be selected with services in mind; for example, if a given service setting will not categorize consumers into multiple attendance categories, it may not be helpful to use categorical attendance as an outcome variable. Instead, predicting attendance continuously may make the most clinical sense, as most service settings can track from week to week whether a consumer is attending. Alternatively, if a service setting's main goal is to prevent consumers from disengaging from services entirely (i.e., dropping out), the prediction of dropout may be most appropriate. Regardless, of clinical and administrative importance, researchers need to adopt a consistent attendance outcome, or at the very least base outcome selection in a practical and methodical context.

Although our review of the extant research points to some general conclusions regarding participation in psychiatric treatment for people with psychotic disorders, the body of literature seems to lack direction. In addition to conducting more rigorous future investigations, we suggest that variables should be selected based on relevant theory. For instance, the Theory of Planned Behavior (TBP; Armitage & Conner, 2001; Hardeman et al., 2002) and expectancy theory (Vroom, 1964) have been applied to many health-related behaviors with success. As an example, TPB has been successfully used to predict attendance to breast cancer screening and follow-up (Cooke & French, 2008). Some variables included in the current literature derive their predictive power through serving as proxies for the actual, relevant constructs. For instance, taking an expectancy theory perspective, symptoms are relevant insofar as they affect perceived valence of the behavior—i.e., does the consumer believe going to group will decrease unwanted symptoms—and expectancy—i.e., does the consumer perceive his symptoms as interfering with his ability to attend group? Further, current theorists in the attendance literature (Mitchell & Selmes, 2007) have posited numerous variables which have yet to be examined in high quality investigations, such as previous bad experiences with treatment, perceived benefits of care, and stigma. Future study in this area is particularly important so that service providers can best target their efforts to maintain consumers in treatment who are at the greatest risk for poor attendance and disengagement/dropout. As this review demonstrates, the corpus of literature has yet to clearly identify many consistent predictors of attendance. If we assume that one must actually attend services to benefit from them, a more in-depth understanding of these issues is critical.

Although this review contributes a much-needed understanding of attendance in psychiatric services, results must be viewed in light of several limitations. Because of the inconsistent reporting patterns, and wide variety of variables studied, we opted not to conduct a meta-analysis at this stage. That type of approach may be helpful when examining specific predictors that have a larger number of studies examining similar constructs. In addition, although our restriction of the review to high quality studies enabled us to have confidence in our findings and point to methodological flaws in the attendance literature, it did limit us to reviewing a small sample of studies, indicating we may have missed

significant predictors tested only by studies we found to be of adequate or low quality.   Relatedly, the included studies were generally modest in sample size; future studies would benefit from having larger, generalizable samples.

Given the crucial role of attendance in the delivery of high-quality mental health services, future research in this area is warranted. Ongoing substance use is one variable which seems to consistently predict risk for lowered attendance or dropout; demographic variables and employment seem to be of little utility in this prediction. Some variables, such as psychiatric symptoms and diagnosis, need further research before consistent associations become apparent, while other variables (such as treatment variables) hold promise but have been minimally researched thus far. Future research must put an emphasis on operationalized attendance terms and choose outcome measurement in the context of practical and theoretical considerations. Researchers should expand their choices of predictor variables to include clinically and theoretically relevant constructs in addition to clarifying relationships with variables which have already been tested.

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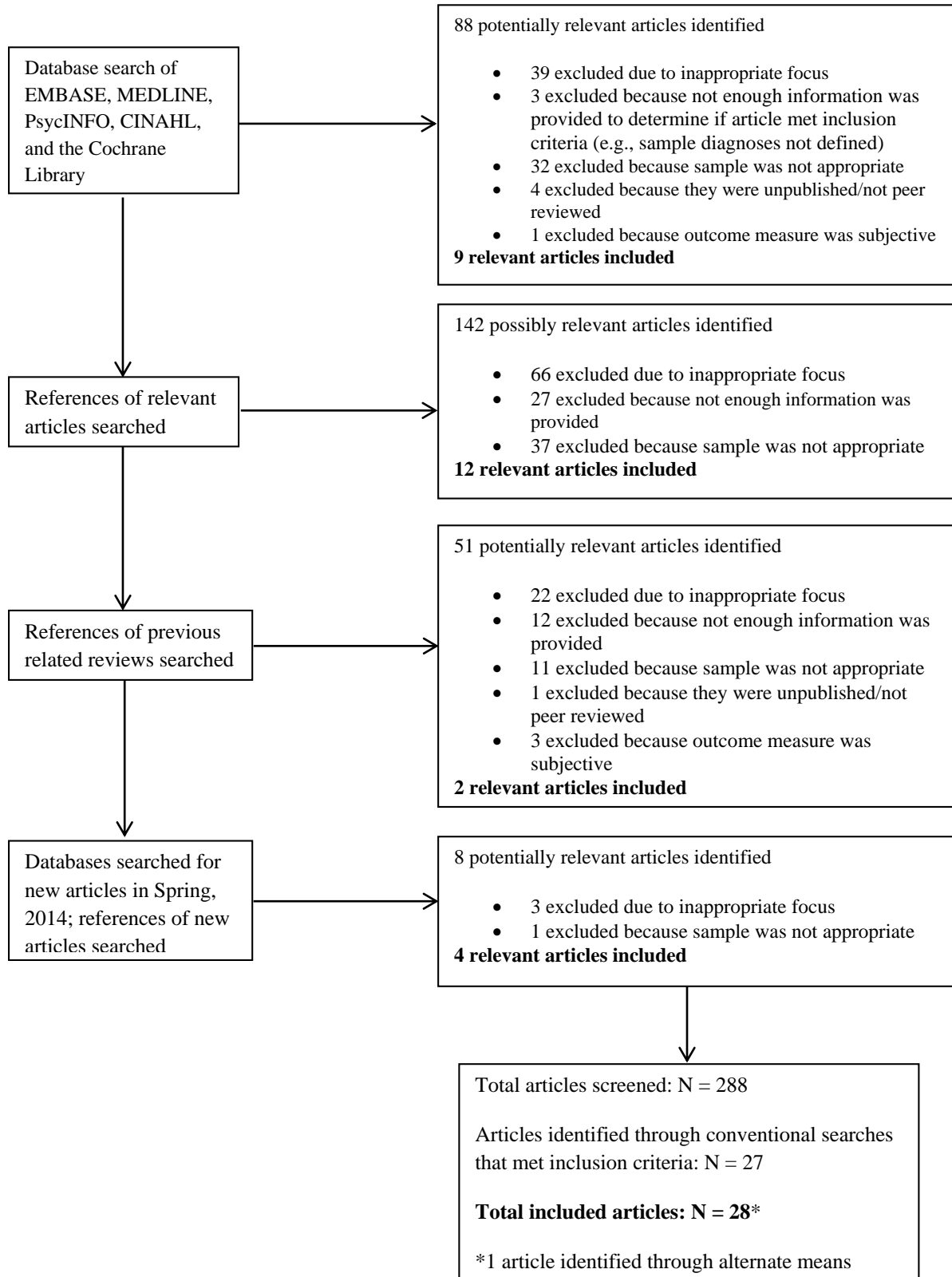   *Psychology: Research and Practice, 24*(2), 190-195.

Figure 1. Flow chart of article exclusion and identification.

Table 1 - Included Studies

Citation	Treatment Type	Location	Outcome	Summary
Adelekan & Ogunlesi, 1990	Outpatient, hospital based (medication management)	Africa (Nigeria)	Attendance: categorical	Cross-sectional, matched control study of people served by the outpatient department of a hospital in Nigeria.
Adelufosi et al., 2013	Outpatient psychiatric clinic (not specific, possibly medication management)	Africa (Nigeria)	Attendance: categorical	Cross-sectional study of people in an outpatient clinic in a psychiatric hospital in Nigeria.
Adeponle et al., 2009	Outpatient (medication management after inpatient stay)	Africa (Nigeria)	Attendance: categorical	Prospective study of people admitted to inpatient care in a psychiatric hospital in Nigeria.
Atwood & Beck, 1985	day treatment, psychotherapy, psychiatrist medication checks	North America (US)	Predicting Dropout	Naturalistic, retrospective study of chronic patients of community mental health clinics in the United States.
Axelrod & Wetzler, 1989	"aftercare" outpatient treatment	North America (US)	Predicting Dropout	Prospective study of people transitioning from inpatient to outpatient aftercare treatment in the United States.
Balikci et al., 2013	Outpatient treatment for schizophrenia	Turkey	Predicting Attendance: Categorical	Prospective study of people with schizophrenia followed for two years after discharge from hospital in Turkey.
Bender & Koshy, 1991	General Outpatient	Asia (India)	Predicting Attendance: Continuous	Prospective study of people in a general outpatient clinic in India.
Bender & Pilling, 1985	Day Care Center (included group/individual/education, etc.)	Europe (UK)	Predicting Attendance: Categorical	Prospective study of people served by a day care center with various treatment approaches in Great Britain.
Brekke et al., 1999	Psychiatric rehabilitation clubhouse	North America (US)	Predicting Attendance: continuous	Secondary prospective analysis of people in a psychiatric rehabilitation clubhouse setting in the United States.

Buchanan,1992	Various Outpatient clinics	Europe (UK)	Predicting Attendance: categorical	Prospective longitudinal study of outpatient clinic use in Great Britain.
Carrion et al., 1993	Groups and med checks	North America (US)	Predicting Attendance: categorical	Longitudinal study of group and individual outpatient treatment in North America.
Cohen et al., 1995	Outpatient with groups, individual, case management	North America (US)	Predicting dropout	Natural retrospective study of individual and group approaches in a community mental health center in the United States.
Conus et al., 2010	Early Psychosis Services	North America (Canada)	Time Engaged	Cross sectional and epidemiological study of people served by an early psychosis clinic in Canada.
Coodin et al., 2004	Severe mental illness treatment education program	North America (Canada)	Predicting Attendance: categorical	Retrospective study of people served by a Schizophrenia treatment education program in Canada.
Cruz & Cruz, 2001	Outpatient case management team model	North America (US)	Predicting attendance: continuous	A study of case management team model in the United States.
Davis et al, 1977	Outpatient University Clinic	North America (US)	Predicting Attendance: categorical	Prospective cohort study of people served by a university clinic in the United States.
Dworkin et al., 1986	Medication and case management	North America (US)	Predicting Dropout	Prospective cohort study of people receiving medication and case management in the United States.
Gopinath et al., 1987	Day hospital	Asia (India)	Predicting Dropout	Retrospective study of individuals served at a day hospital in India.
Kurtz et al., 2011	Outpatient psychosocial rehabilitation program	North America (US)	Predicting Dropout	Longitudinal study of outpatient day program in United States.
Lim et al., 1995	Outpatient Psychiatric	Asia (Singapore)	Predicting Attendance: categorical	Retrospective record review of outpatient treatment in Singapore.

Miller et al., 2009	Outpatient treatment including family/individual/group	North America (US)	Time Engaged	Prospective longitudinal study of people with First Episode Psychosis treated in outpatient treatment in the United States.
Schimmelman et al., 2006	Outpatient early psychosis services with therapy, case management, medication management, etc.	Australia (Melbourne)	Time Engaged	Epidemiological retrospective data analysis of people served by an Early Psychosis Clinic.
Sparr et al., 1993	Outpatient including medication/supportive therapy and insight oriented therapy	North America (US)	Predicting attendance: categorical	Prospective descriptive survey of veterans in an outpatient hospital setting in the United States.
Stowkowy et al., 2012	Early Psychosis Treatment Service	North America (Canada)	Time Engaged + Predicting attendance categorical	Prospective longitudinal study of people served by an Early Psychosis Treatment Service in Canada.
Svettini et al., 1998	Therapeutic Rehabilitative Program	Europe (Italy)	Predicting attendance: categorical	Retrospective naturalistic study of people served by a therapeutic rehabilitative program in Italy.
Tsang et al., 2010	Psychiatric Rehabilitation Services	Asia (China)	Predicting Attendance: categorical	Cross-sectional study of people served by psychiatric rehabilitation services in China.
Turner et al., 2007	Early Psychosis Treatment Service	New Zealand	Predicting Dropout	Prospective study of early psychosis treatment in New Zealand.
Ucok et al., 2007	Varied-diverse sites	Turkey	Time Engaged + Predicting Dropout	Naturalistic study of diverse outpatient sites in Turkey.

Table 2

Quality Rating Scheme

Quality Criterion	Optimum	Adequate	Least valuable
Study Design	Randomized (controlled or uncontrolled), longitudinal	Cross-sectional design or case-control study	Case series without controls or comparison groups
Purpose	Specifically designed to observe attendance and its predictors	Secondary analysis of another study looking at attendance	Inadequate data on attendance/predictors
Data collection methods/Measures	Face to face interview AND/OR record review; data collection methods are appropriate to the variables collected - psychometrically validated measures used in SMI covering attendance/other outcome variables	Some variables are assessed rigorously while others rely on self-report. Limited measures on associations with attendance and/or limited validity of measures used	Self-report only. No valid measures of attendance variables
Sampling & sample	Sample is representative of population & sufficient size to enable generalizability. Sampling procedure adequately described	Sample is representative of population with psychotic disorders. May have limited generalizability to some groups	Non-representative samples OR small samples with inadequate numbers to make reliable estimates
Completeness of data	Attendance information/predictor variables supplied for full sample. Patterns of attendance identified.	Attendance information/predictor variables supplied for most of the sample	Attendance information/predictor variables supplied for little or none of the sample
Operationalized dropout/attendance terms	All attendance terms are operationally defined and adequately precise. Attendance is measured using objective indicators	Attendance is operationally defined but lacks sufficient precision and/or clarity. Attendance/engagement may be measured using more subjective indicators (e.g., Likert scale survey)	Terms are used inconsistently or not defined at all
Information on study sample	Sufficient background (including demographics) and clinical information is provided	Limited information on age or location but no other data. Cannot fully characterize sample due to insufficient information provided	No clear data on study population

Table 3 – Quality Ratings

Study	Sample Size	Study Design	Purpose	Data Collection methods and measure	Sampling and sample	Completeness of data	Operationalized dropout/attendance terms	Information of study sample	Overall Confidence
Adelekan & Ogunlesi, 1990	138[1]	Optimum	Optimum	Adequate	Least Valuable	Adequate	Optimum	Optimum	Moderate
Adelufosi et al., 2013	313	Optimum	Optimum	Optimum	Adequate	Optimum	Optimum	Optimum	High
Adenponle et al., 2009	81	Optimum	Optimum	Optimum	Adequate	Optimum	Optimum	Optimum	High
Atwood & Beck, 1985	125	Optimum	Optimum	Optimum	Adequate	Adequate	Adequate	Optimum	Moderate
Axelrod & Wexler, 1989	103	Optimum	Optimum	Adequate	Adequate	Adequate	Adequate	Optimum	Moderate
Balikci et al., 2013	132	Optimum	Optimum	Optimum	Adequate	Adequate	Adequate	Optimum	Moderate
Bender & Koshy, 1991	437	Optimum	Optimum	Adequate	Optimum	Optimum	Adequate	Least Valuable	Moderate
Bender & Pilling, 1985	40	Optimum	Optimum	Optimum	Least Valuable	Adequate	Adequate	Adequate	Moderate
Brekke et al., 1999	41[2]	Optimum	Optimum	Optimum	Least Valuable	Optimum	Optimum	Optimum	Moderate
Buchanan, 1992	61	Optimum	Optimum	Adequate	Least Valuable	Optimum	Adequate	Optimum	Moderate
Carrion et al., 1993	111	Optimum	Optimum	Optimum	Adequate	Optimum	Optimum	Optimum	High

[1] 69 treatment defaulters, 69 control non-defaulters

[2] 41 participants at baseline, 30 participants at 12 months

Study	N								
Cohen, 1995	112	Optimum	Optimum	Adequate	Adequate	Adequate	Optimum	Optimum	Moderate
Conus et al., 2010	660	Optimum	Optimum	Optimum	Optimum	Optimum	Optimum	Optimum	High
Coodin et al., 2004	342	Optimum	Optimum	Adequate	Adequate	Adequate	Adequate	Adequate	Moderate
Cruz & Cruz, 2001	26 and 21	Optimum	Optimum	Optimum	Least Valuable	Optimum	Adequate	Optimum	Moderate
Davis, 1977	115	Optimum	Optimum	Adequate	Adequate	Adequate	Adequate	Adequate	Moderate
Dworkin et al., 1986	657	Optimum	Optimum	Adequate	Adequate	Adequate	Adequate	Optimum	Moderate
Gopinath et al., 1987	205	Optimum	Optimum	Adequate	Adequate	Least Valuable	Adequate	Least Valuable	Low
Kurtz et al., 2011	127	Optimum	Optimum	Optimum	Optimum	Optimum	Adequate	Optimum	High
Lim et al., 1995	100	Optimum	Optimum	Adequate	Adequate	Least Valuable	Optimum	Adequate	Moderate
Miller et al., 2009	112	Optimum	Adequate	Optimum	Adequate	Optimum	Adequate	Optimum	Moderate
Schimmelmann et al., 2006	134	Optimum	Optimum	Optimum	Adequate	Optimum	Optimum	Optimum	High
Sparr et al., 1993	130	Optimum	Optimum	Adequate	Optimum	Optimum	Adequate	Optimum	High
Stowkowy et al., 2012	266	Optimum	Optimum	Optimum	Optimum	Optimum	Optimum	Optimum	High
Svettini, 1998	93[3]	Optimum	Optimum	Optimum	Adequate	Optimum	Optimum	Adequate	High
Tsang et al., 2010	105	Optimum	Adequate	Adequate	Adequate	Optimum	Adequate	Optimum	Moderate
Turner et al., 2007	232	Optimum	Optimum	Optimum	Adequate	Adequate	Optimum	Optimum	High

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[3] 93 total participants, a subset of 55 have diagnosis of schizophrenia; in order to keep results comparable to those of other reviewed studies, only results for the full sample are reported herein.

| Ucok et al., 2007 | 382 | Optimum | Optimum | Optimum | Optimum | Optimum | Optimum | Optimum | High |

Table 4 - Correlates and Significance Findings

Correlate	Times examined	Times found significant	Direction of significance	Studies finding non-significance
Demographics				
Age	9	1	Older predicted better attendance (Kurtz et al., 2011)	Adelufosi et al., 2013; Adeponle et al., 2009; Conus et al., 2010; Schimmelman et al., 2006; Stowkowy et al., 2012; Svettini et al., 1998; Turner et al., 2007; Ucok et al., 2007
Race/Ethnicity	2	0	n/a	Kurtz et al., 2011; Turner et al., 2007
Sex	8	0	n/a	Adelufosi et al., 2013; Adeponle et al., 2009; Conus et al., 2010; Kurtz et al., 2011; Schimmelman et al., 2006; Stowkowy et al., 2012; Svettini et al., 1998; Turner et al., 2007
Education	5	1	Less education predicts less attendance (Ucok et al., 2007)	Adelufosi et al., 2013; Adeponle et al., 2009; Kurtz et al., 2011; Svettini et al., 1998
Marital status	4	0	n/a	Adelufosi et al., 2013; Adeponle et al., 2009; Stowkowy et al., 2012; Svettini et al., 1998
Religion	1	0	n/a	Adelufosi et al., 2013
Parental Education	1	0	n/a	Kurtz et al., 2011
Living away from family	6	2	Predicted less attendance (Conus et al., 2010; Schimmelman et al., 2006)	Adelufosi et al., 2013; Stowkowy et al., 2012; Svettini et al., 1998; Turner et al., 2007
Distance from service site	2	2	Greater distance predicts less attendance (Adelufosi et al., 2013; Adeponle et al., 2009)	
Cost of treatment	2	1	Lack of health care coverage predicts less attendance (Ucok et al., 2007)	Adelufosi et al., 2013
SES	1	0		Svettini et al., 1998
Symptoms/Illness				
Diagnosis	7	6	Other psychosis diagnosis predicts less attendance as compared to schizophrenia (Conus et al., 2010; Stowkowy et al., 2012); substance use diagnosis predicts less attendance (as compared to affective diagnosis; (Adeponle et al., 2009)); PTSD and/or substance abuse diagnosis predicts less attendance (as compared to schizophrenia, major depression, bipolar, dysthymic disorder (Sparr et al., 1993)); schizophrenia diagnosis predicts more attendance compared to all other diagnoses (Svettini et al., 1998);	Other psychosis diagnosis a trend (.08) in one other study (Schimmelman et al., 2006)

			diagnosis other than mood disorder predicts less attendance (Turner et al., 2007)	
Positive symptoms	5	0	n/a	Kurtz et al., 2011; Stowkowy et al., 2012; Svettini et al., 1998; Turner et al., 2007; Ucok et al., 2007
Negative symptoms	5	1	Fewer negative symptoms predicted less attendance (Stowkowy et al., 2012)	Kurtz et al., 2011; Svettini et al., 1998; Turner et al., 2007; Ucok et al., 2007; Note that Svettini et al., 1998 found the single affective flattening item to predict attendance
Hostility	1	0	n/a	Kurtz et al., 2011
Emotional Discomfort	1	0	n/a	Kurtz et al., 2011
Suspiciousness	1	1	Greater suspiciousness predicts less attendance (Ucok et al., 2007)	
Depression (symptoms, not diagnosis)	1	0	n/a	Stowkowy et al., 2012
Baseline illness severity	8	5	Worse severity predicted less attendance (Adelufosi et al., 2013; Adeponle et al., 2009; Conus et al., 2010; Schimmelman et al., 2006; Stowkowy et al., 2012); worse severity predicted better attendance (Turner et al., 2007)	Svettini et al., 1998; Ucok et al., 2007
Duration of untreated psychosis	4	2	Shorter duration of untreated psychosis predicts less attendance (Stowkowy et al., 2012); longer duration of untreated psychosis predicts more attendance(Turner et al., 2007)	Conus et al., 2010; Schimmelman et al., 2006
Duration of prodrome	1	1	Shorter predicted less attendance (Conus et al., 2010)	
Duration of illness	4	0	n/a	Adelufosi et al., 2013; Adeponle et al., 2009; Kurtz et al., 2011; Svettini et al., 1998
Age at onset	5	1	Older age predicts less attendance (Ucok et al., 2007)	Conus et al., 2010; Kurtz et al., 2011; Stowkowy et al., 2012; Svettini et al., 1998
Insight	4	1	Low insight predicts less attendance (Turner et al., 2007)	Conus et al., 2010; Schimmelman et al., 2006; Stowkowy et al., 2012
Functioning				
Premorbid functioning	3	1	Lower predicted less attendance (Conus et al., 2010)	Schimmelman et al., 2006; Stowkowy et al., 2012
Baseline functioning	4	2	Lower predicted less attendance (Conus et al., 2010; Schimmelman et al., 2006)	Stowkowy et al., 2012; Svettini et al., 1998
Employment	7	1	Unemployment predicted less attendance (Conus et al., 2010)	Adelufosi et al., 2013; Adeponle et al., 2009; Schimmelman et al., 2006;

				Svettini et al., 1998; Turner et al., 2007; Ucok et al., 2007
Psychiatric History				
Past psychiatric history	2	0	n/a	Conus et al., 2010; Schimmelman et al., 2006
Family psychiatric history	3	0	n/a	Conus et al., 2010; Schimmelman et al., 2006; Svettini et al., 1998
Past substance use	2	0	n/a	Conus et al., 2010; Svettini et al., 1998
Abuse history (physical or sexual)	1	0	n/a	Conus et al., 2010
Past suicide attempts	2	0	n/a	Conus et al., 2010; Schimmelman et al., 2006
Hospitalization History	4	0	n/a	Adelufosi et al., 2013; Adeponle et al., 2009; Kurtz et al., 2011; Turner et al., 2007
Forensic history before treatment	2	1	Predicted less attendance (Conus et al., 2010)	Turner et al., 2007
Previous treatment	1	0	n/a	Adeponle et al., 2009
History of compulsive treatment	2	1	Predicted less attendance (Svettini et al., 1998)	Turner et al., 2007
Social functioning	1	0		Turner et al., 2007
Cognition				
Verbal intelligence/fluency	1	1	Higher predicted better attendance (Kurtz et al., 2011)	
Memory	1	0	n/a	Kurtz et al., 2011
Problem-solving skills	1	0	n/a	Kurtz et al., 2011
Cognitive impairment	2	0	n/a	Kurtz et al., 2011; Stowkowy et al., 2012
Social Support				
Family involved in treatment	2	2	Family involvement predicted better attendance (Adeponle et al., 2009; Stowkowy et al., 2012)	
Perceived social support	1	0	n/a	Adelufosi et al., 2013
Medication				
Medication compliance	1	1	Less compliance predicts less attendance (Ucok et al., 2007)	
Use of haldol	1	1	Predicts less attendance (Ucok et al., 2007)	
Use of depot medications	1	0	n/a	Ucok et al., 2007
Medication side effects	1	0	n/a	Adeponle et al., 2009
Treatment Variables				
Specialized outpatient unit	1	1	Predicts more attendance (Ucok et al., 2007)	

Length of time to appointment	1	0	n/a	Adelufosi et al., 2013
Satisfaction with treatment	1	1	Dissatisfaction predicts less attendance (Adelufosi et al., 2013)	
Number of past missed appointments	1	1	More missed appointments predicts less attendance (Adelufosi et al., 2013)	
Type of treatment (group or individual)	1	1	Varied by month (Carrion et al., 1993)	
Sustained substance use during study	4	4	Presence predicted less attendance (Conus et al., 2010; Schimmelman et al., 2006; Stowkowy et al., 2012; Turner et al., 2007)	