Medication adherence and treatment satisfaction in patients nursing essay

Abstract

Background and Objective: Medication adherence and treatment satisfaction are important for successful therapeutic outcome. The objectives of this study were to (1) assess antipsychotic medication adherence using 8-item Morisky Medication Adherence Scale (MMAS), (2) assess treatment satisfaction using Treatment Satisfaction Questionnaire for Medication (TSQM 1. 4), and (3) correlate adherence and satisfaction with psychiatric symptoms measured using 24-item expanded Brief Psychiatric Rating Scale (BPRS-E) in patients with schizophrenia.

Methodology: This is a cross sectional study Admin2010-12-25T10: 07: 00

Also, You should mention your design of study inside the textcarried out at governmental out-patient psychiatric unit in Nablus/ Palestine during summer 2010. Two hundred and sixty seven schizophrenic patients were registered at the clinic. Patients included in the study were those whose medications have not been changed in the past six months and those who did not have an acute attack in the past year. Data were entered and analyzed using SPSS 16 for windows.

Results: One hundred and fifty patients Admin2010-12-25T12: 46: 00

In cross sectional study, you should calculate the sample size to give a good precision for reliability and validity.

These terms increase the quality and acceptance rate of articles. out of 267 registered schizophrenic patients met the inclusion criteria. Nineteen patients refused to participate while 131 patients agreed giving a response

rate of 87. 3%. The mean ± SD of MMAS was 6. 1 ± 1. 7 in which 44 patients (33. 6%) had low rate, 58(44. 3%) had medium rate & 29 (22. 1%) had high rate of adherence to their antipsychotic medications. The means of satisfaction with regard to effectiveness, side effects, convenience & global satisfaction were 72. 6 ± 20. 5, 67. 9 ± 31. 47, 63. 2 ± 14. 3 & 63. 1 ± 18. 8 respectively. The mean BPRS score of the patients was 68. 4 ± 24. 5 with 14. 4 ± 6. 7 & 13. 7 ± 6. 1 means for positive and negative symptoms scores respectively. Pearson correlation showed that there was a positive and significant correlation between effectiveness (P = 0. 002, r = 0. 27), side effects (0. 006, r = 0. 24), convenience (P <0. 001, r = 0. 46) and global satisfaction (<0. 001, r = 0. 31) with adherence. Significant negative correlation existed between BPRS score (P = 0. 003, r = - 0. 26), positive symptoms (P = 0. 001, r = - 0. 3) but not negative symptom (P = 0. 8) with adherence. No significant difference in the means of adherence score, BPRS, negative score, positive score, all satisfaction domains, except side effects (P= 0. 006), among patients receiving different antipsychotic regimens.

Discussion and Conclusion: conclusions can be summarized as follows: First, the majority of the patients had low to medium rate of adherence. Second, adherence was positively and significantly correlated with satisfaction. Third, adherence was significantly but negatively correlated with most psychiatric symptoms. Fourth, no significant difference in adherence was found among patients receiving various antipsychotic therapeutic regimens. Finally, various antipsychotic regimens significantly differ in side effects satisfaction domain only.

Key words: adherence, satisfaction, psychiatric symptoms, antipsychotics

Introduction

Schizophrenia is a chronic psychiatric disorder that impairs the quality of patients' life and requires pharmacological and non-pharmacological interventions (Palmer et al., 2002; Pinikahana et al., 2002; Sharma and Antonova, 2003). Antipsychotic drug therapy is considered as the key element in schizophrenia management and has been reported to minimize the frequency of acute schizophrenic episodes and hospitalization (Awad and Voruganti 2004; Campell et al., 1999). Adherence (compliance) to antipsychotic medications is necessary in order to achieve these therapeutic goals. Furthermore, adherence has been reported to lead to considerable cost savings (Damen et al., 2008). However, non-adherence (non-compliance) to antipsychotic medications is common and is considered as an integral barrier to the successful treatment of schizophrenia (Dolder et. al, 2003; Weiden 2007; Byrne et al., 2006; Kim et al., 2006). There are several factors that can cause treatment non-adherence in schizophrenic patients. Such factors include those derived from schizophrenic disorder itself, patient characteristics, those associated with the health-care system, and the antipsychotic treatment regimen (Svestka & Bitter 2007; Misdrahi et al., 2002). Patients related factors contributing to non-adherence include gender, age, socio-economic status, race, and religion (Lowry 1998; Borras et al 2007). Cultural differences might be a potential factor for non-adherence. For example, a review article about psychotropic medications found that rates of non-adherence were higher among Latinos than Euro-Americans and clinical and research interventions to improve adherence

should be culturally appropriate and incorporate identified factors (Lanouette et al., 2009). Although patient's satisfaction with treatment regimen is crucial for medication adherence (Atkinson et al., 2004; Taira et al. 2006), few studies had examined the relationship between adherence, treatment satisfaction and therapeutic outcome in patients with schizophrenia (Fujikawa et al.; 2004; Freudenreich et al., 2004 Watanabe et al, 2004).

Therefore, the objectives of this study were to:

(1) Assess the degree of adherence to antipsychotic medications among schizophrenic outpatients using eight-item Morisky Medication Adherence Scale (MMAS),

(2) Assess the degree of patients' satisfaction with their treatment regimen using Treatment satisfaction Questionnaire for medication (TSQM 1. 4),

(3) Evaluate patients' clinical symptoms, Positive Symptom Score (PSS) & Negative Symptom Score (NSS) using Brief Psychiatric Rating Scale (BPRS), and finally

(4) Investigate relationships and correlations between medication adherence, subjective patients' treatment satisfaction and psychiatric symptoms in patients with schizophrenia.

Methodology

2. 1. Patient selection:

This study was conducted between July 2010 & September 2010 at Al-Makhfya psychiatric Health Center in Nablus, Palestine. Approval to perform

the study was obtained from the Palestinian ministry of health and IRBAdmin2010-12-25T10: 09: 00

Define this abbreviation committee at An-Najah National University. Patients who met the following criteria were invited to participate in this study: 1) their age was between 20 & 65 years, 2) they were diagnosed with schizophrenia as defined by DSMAdmin2010-12-25T13: 29: 00

Define this abbrev.-IV, 3) they had not been suffering from an acute attack of illness during the past year, and 4) their drug regimen had not been changed in the past 4 months.

2. 2. Assessment and measures

The instrument used in this study consisted of three parts: part one collected socio-demographic and medication data from patient’s medical files; part two was the Arabic version of the validated eight-item Morisky Medication Admin2010-12-25T13: 31: 00

. The final version of the Arabic questionnaire should be assessed to know if the Arabic version is reliable and valid to be used in your population. This a routine question by high impact journal

Also, I suppose you are the first who use this score in Arab country, and this is good for you because you can write new article related to validity and reliability and it is preferred to be published before this article. Adherence Scale (MMAS) (Morisky et al., 2008, Morisky et al., 1986) and part three was the Arabic version of Treatment Satisfaction Questionnaire for Medication (TSQM 1. 4) which the researchers obtained from Quintiles Strategic

Research Services. The English version of the MMAS was translated into Arabic and was approved by professor Morisky through e-mail communication. The translation process was carried out according to the following procedure: 1) A forward translation of the original questionnaire was carried out from English to Arabic language to produce a version that was as close as possible to the original questionnaire in concept and meaning. Translation was carried out by two qualified independent translators; both native speakers of Arabic and proficient in English. Each translator produced a forward translation of the original questionnaire into Arabic language without any mutual consultation. The corresponding author, who is a native Arabic speaker, reviewed the two primary versions and compared them with the original. (2) A back translation from Arabic language to English was carried out by two different translators after lengthy discussion between the translators and the corresponding author. (3) The back translated questionnaire was approved by Professor Donald Morisky through e-mail. The Arabic version of MMAS is an 8-item questionnaire with 7 yes/no questions while the last question was a 5-point likert question. Based on the scoring system of MMAS, adherence was rated as follows: high adherence (= 8), medium adherence (6 – <8) and low adherence (< 6). Patients who met the criteria and agreed to participate were interviewed and asked by the authors to answer the Arabic version of MMAS & TSQM 1. 4.

The TSQM 1. 4 is a 14-item psychometrically robust and validated instrument consisting of four scales [Bahramal et al., 2009]. The four scales of the TSQM 1. 4 include the effectiveness scale (questions 1 to 3), the side effects scale (questions 4 to 8), the convenience scale (questions 9 to 11) and the global

satisfaction scale (questions 12 to 14). The TSQM 1. 4 domain scores were calculated as recommended by the instrument's authors, which is described in detail elsewhere (Atkinson et al., 2004; Atkinson et al., 2005). The TSQM 1. 4 domain scores range from 0 to 100 with higher scores representing higher satisfaction on that domain.

Psychiatric symptoms, positive and negative schizophrenic symptoms were evaluated by a psychiatrist and well trained psychologists using the expanded Brief Psychiatric Rating Scale (BPRS-E) (Overall and Gorham, 1962; Overall 1988; Lukoff et al., 1986; Ventura et al, 1993) at the same visit. The BPRS-E consists of 24 items measuring psychiatric symptoms. It measures four different dimensions: manic excitement/ disorganization, positive symptoms, negative symptoms, and depression/ anxiety (Ruggeri et al., 2005). Positive symptoms were the followings: grandiosity, suspiciousness, hallucinations, unusual thought content and conceptual disorganization. Negative symptoms included disorientation, blunted affect, emotional withdrawal, motor retardation, and mannerism and posturing.

2. 3. Data analysis

Continuous variables like Morisky score, satisfaction domain scores, BPRS, positive and negative symptoms scores were expressed as mean ± SD. Correlation between continuous variables was carried out using Pearson correlation test. Difference in means was carried out using one-way ANOVA test. All statistical analyses were conducted using Statistical Package for Social Sciences (SPSS; version 16. 0) for Windows. The conventional 5 percent significance level was used throughout the study.

Results

Demographic and clinical characteristics of patients

One hundred and fifty patients out of 267 registered schizophrenic patients met the inclusion criteria. One hundred and thirty one (131) patients agreed to participate giving a response rate of 87. 3%. Of the 131 patients, 40 (30. 5%) were female and 91 (69. 5%) were male. The mean age of the patients was 42. 9 ± 10. 3 years (range = 20 – 65 years). The mean duration of illness was 16. 23 ± 9. 59 years. Eighteen patients (13. 7%) had other non-psychiatric diseases mainly diabetes mellitus (10 patients; 7. 6%). Smoker schizophrenic patients represented 55% (72 patients) of the sample. None of the patients were reported to have any type of drug abuse. Details regarding demographic and clinical characteristics of the studied patients are shown in Table 1.

Regarding treatment regimens, patients were grouped into 7 categories based on the type of antipsychotic medications they were using: Twenty four patients (18. 3%) had been treated with oral typical antipsychotics only, 8 patients (6. 1%) were using combination oral typical antipsychotics, 19 (14. 5%) had been treated with typical depot injections only, 37 (28. 2%) had been treated with typical oral and depot injections, 18 (13. 7%) had been treated with oral atypical only, 12 patients (9. 2%) had been treated with typical and atypical oral antipsychotics, and finally 13 patients (9. 9%) had been treated with atypical oral and typical depot injection combination. The most common oral typical antipsychotic used by the patients was chloropromazine while the most common atypical antipsychotic was clozapine.

Based on MMASAdmin2010-12-25T13: 34: 00

It is preferred to classify the characteristic of patients according to the adherence groups. Also, indicate if there is differences between the 3 groups , 44 (33. 6%) of patients were rated as having low adherence, 58 (44. 3%) were rated as having medium adherence & 29 (22. 1%) were rated as having high adherence to their antipsychotic medications. The average adherence score (6. 1 ± 1. 7) for the patients generally indicates medium rate of adherence. Upon investigation using 8-item Morisky scale (questionnaire), we found that about 33. 6% of patients forgot to take their medications; 15. 3% of patients missed taking their medication for reason other than forgetting in the past two weeks before the interview; 13. 7% stopped taking their medication without doctor counseling when they felt worse upon taking them; 16. 8% forgot to take their medications with them when they leave home for long time; 10. 7% didn’t take their medication in the day before interview; 26% stopped taking their medication when they felt that their health is under control; and 55. 7% felt hassled about sticking to their treatment plan. As for remembering to take their medications; 27. 5% of the patients faced a difficulty in doing this once in a while; 6. 1% of the sample sometimes had difficulties in remembering to take their medications; 6. 9% of patients usually found difficulties; while 0. 8% of schizophrenic patients faced these difficulties all the times. However 58. 8% didn’t show any difficulty in remembering to take their medication on time. Response to each question in the modified Morisky questionnaire is shown in Table 2.

The average score of satisfaction with regard to effectiveness, side effects, convenience & global satisfaction was 72. 6 ±20. 5; 67. 9 ± 31. 5; 63. 2 ±

14. 3; & 63. 1 ± 18. 8 respectively. The mean BPRS score of the patients was 68. 4 ± 24. 5 with 14. 4 ± 6. 7 & 13. 7 ± 6. 1 means for positive and negative symptoms scores respectively

Correlation between adherence scores and other variables

There was a significant positive correlation between age and adherence (P = 0. 028; r = 0. 19Admin2010-12-25T13: 35: 00

As recommended, when correlation is less than 0. 25 this considered as no or week correlation, 0. 25-0. 50 considered fair correlation. You can take this comments in your consideration.

). However, no such correlation was observed with the duration of illness (P = 0. 13). Furthermore, no significant difference in the means of adherence was found between male and female (P = 0. 76). Patients having other chronic diseases have significantly higher adherence score compared to those who do not, but the significance was at the borderline (P = 0. 049).

Pearson correlation showed that there was a positive and significant correlation between all satisfaction domains like effectiveness (P = 0. 002, r = 0. 27), side effects (P= 0. 006, r = 0. 24), convenience (P <0. 001, r = 0. 46), global satisfaction (P < 0. 001, r = 0. 31) with adherence. Significant but negative correlation existed between psychiatric symptoms (BPRS score; P = 0. 003, r= - 0. 26), positive (P = 0. 001, r = - 0. 3) but not negative symptom score (P = 0. 3) with adherence. Psychiatric symptoms (BPRS, positive and negative symptoms) were significantly correlated with most domains of satisfaction. See table 3 for details.

Adherence, Treatment Satisfaction and type of antipsychotic regimen

Adherence score was not significantly different (P = 0. 6) among patients having different antipsychotic therapeutic regimens. Analysis of satisfaction based on the antipsychotic drug regimens showed that there was a significant difference in satisfaction with regard to side effects among different antipsychotic regimens (P = 0. 006, F = 3Admin2010-12-25T13: 35: 00

When you use one way ANOVA, it is recommended to use the Tukey post-hoc test to test the differences in the means between categories. To determine which group or groups are significant.

). Patients on atypical antipsychotic drug therapy showed the highest satisfaction with side effects (86. 5 ± 4. 8) compared with (51. 3 ± 5. 17) to those on typical antipsychotic mono-therapy. No significant difference with regard to other satisfaction domains (effectiveness, convenience and global satisfaction) among patients with different psychiatric regimens. Similarly no significant difference was found in BPRS scores (P = 0. 6), positive (P = 0. 6) and negative symptoms (P= 0. 8) among different antipsychotic drug regimens. Details regarding adherence scores, BPRS, positive and negative symptoms with different antipsychotic drug regimens are shown in Table 4.

Discussion

This studyAdmin2010-12-25T13: 36: 00

This study is the first of its type in Palestine and the first study used an Arabic version for Morisky. You can add this points as originality of the article

was conducted to assess medication adherence and treatment satisfaction among schizophrenic outpatients. The conclusions of the study can be summarized as follows: First, the majority (78%) of the patients had low to medium adherence rate. Second, adherence was positively and significantly correlated with treatment satisfaction. Third, adherence was significantly correlated with positive but negative psychiatric symptoms. Fourth, no significant difference in rate of adherence was found between patients using typical or atypical antipsychotic therapeutic regimens. Finally, patients on typical or atypical antipsychotic medications had similar scores in all domains of satisfaction except for that of side effects.

Regarding rate of adherence, several studies have shown that up to 80% of all schizophrenic patients discontinue antipsychotic medications and that non-adherence rates ranging from 20% to 89%, with an average rate of approximately 50%, have been reported (Fenton et al, 1997; Lacro et al 2002, Young et al, 1986). Differences in rate of adherence among different reports might be attributed to different instrument used to assess adherence, social and cultural differences among different countries and differences in healthcare systems (Breen et al., 2007). In our study, younger patients had significantly lower adherence score than elderly patients. This finding is in agreement with other researchers who reported that younger schizophrenic patients have lesser adherence than older patients (Sajatovic et al 2007; Hui et al reported that younger age is a predictor for discontinuation of antipsychotic therapy (Hui et al.; 2006). However, other researchers reported equal non adherence among middle aged and elderly patients (Jeste et al., 2003) . Many factors have been cited as a potential

cause for poor adherence. Side effects are key factors influencing compliance with antipsychotic medication (Weiden et al., 2004). (Liu-Seifert et al., 2005; Fleischhacker et al., 2003).

There are few reports suggesting that treatment satisfaction is positively associated with antipsychotic medication adherence [Gharbawi et al., 2006,], improved clinical outcomes [Masand and Narasimhan, 2006], and quality of life [Hofer 2004,]. Our results give further support that treatment satisfaction is positively associated with adherence and symptom improvement, particularly psychotic positive symptoms. A study by Maneesakorn 2008 indicated that antipsychotic medication adherence has positive impact on psychiatric symptoms and satisfaction with medication (Maneesakron et al., 2007). Furthermore, Mohamad et al 2009 demonstrated an association between positive attitudes toward medication among schizophrenia patients and lower rates of study discontinuation (Mohamed et al., 2009). Thus, it is important to accurately evaluate patient satisfaction with medication treatment using validated instruments that can be utilized in clinical trials and practice. Medication non-adherence had a significantly negative impact on treatment response, highlighting the importance of adherence to achieve satisfactory treatment outcome (Lindameyr et al., 2009). A study by Liu-Seifert et al 2005 has found that discontinuing of treatment may lead to exacerbation of psychiatric symptoms and undermining therapeutic progress (Liu-Seifert et al., 2005). In these studies, poor response to treatment and worsening of underlying psychiatric symptoms, and to a lesser extent, intolerability to medication were the primary contributors to treatment being discontinued.

Fewer extrapyramidal symptoms and tardive dyskinesia of atypical compared to typical antipsychotics led researchers to speculate that patients receiving atypical antipsychotics will show greater adherence, satisfaction and psychiatric improvement compared to patients receiving typical antipsychotics (Kane et al., 1988; Tollefson et al., 1997; Marder et al., 1994; Small et al., 1997 Jeste et al., 1999; Marder SR, 1998). However, our findings regarding adherence, satisfaction and psychiatric symptoms measured by BPRS-E were similar between patients on typical and atypical antipsychotic medications. Rosenheck and colleagues evaluated medication continuation and regimen adherence in 423 patients taking haloperidol or clozapine as part of a double-blind, randomized trial. Although the patients who received clozapine continued their medication significantly longer, the treatment groups did not differ in the proportion of pills returned each week (Rosenheck et al., 200). Olfson and colleagues examined the effect of antipsychotic type on adherence 3 months after 213 inpatients with schizophrenia or schizoaffective disorder were discharged while receiving typical (84. 5% of patients) or atypical (14. 5% of patients) antipsychotics. A non-significant trend toward increased adherence was reported among patients with prescriptions for atypical antipsychotics (Olfson et al., 2000). Cabeza and colleagues retrospectively studied the relationship of adherence to antipsychotic type in 60 inpatients with schizophrenia. No significant association was found between adherence and type of antipsychotic (Cabeza et al., 2000). Dolder reported that patients on either typical or atypical had similar low rates of adherence (Dodler et al., 2002). Gianfransessco et al 2006 indicated that none of the atypicals showed treatment durations significantly different from the typical (Gianfransessco et al 2006). A study

by Jones et al, 2006 has found that in people with schizophrenia whose medication is changed for clinical reasons, there is no disadvantage across 1 year in terms of quality of life, symptoms, or associated costs of care in using FGAs rather than nonclozapine SGAs (Jones et al., 2006). Schulte et al concluded that, in general, very few or no advantages are to be gained from using SGAS rather than FGAS and the clinical effectiveness is not increased, but the side-effects are different. (Schulte et al 2010). In contrast, Al-Zakawani reported that atypical antipsychotic users were significantly more adherent to therapy, and had lower rates of office, hospital and emergency room utilization (Al-zakawani 2003). Actually, efficacy variations within SGAs and FGAs result in overlaps between the two groups and classification of antipsychotics into the two groups is no longer useful (Volvoka 2009). One might argue that cost of atypical antipschyotics is the barrier for medication adherence (Gibson et al., 2010). However, in our study, all patients had governmental insurance and therefore cost of medications was not a reason of poor adherence of atypical antipsychotics.

Regarding results of depot IM antipsychotic injections, we found no difference between oral and long acting antipsychotics with regard to adherence, satisfaction or psychiatric symptoms. Some researchers reported similar or better adherence, satisfaction and outcome with long acting injection than oral antipsychotics (Olivares et al., 2009; Gutierrez et al., 2010; Kane and Garcia 2009; Haddad et al., 2009). In contrast, vehof reported that patients on depot antipsychotics were less adherent and have more side effects than oral antipsychotics (Vehof et al., 2008).

Our study has few limitations. The sample size might be relatively small to draw conclusions for assessing adherence, satisfaction and psychiatric symptoms. Instruments that we used to assess adherence, satisfaction and BPRS are might not be the gold standard for this purpose. A third Admin2010-12-25T13: 16: 00

Must be preceded by first and secondpotential limitation of our study is that the patients selected were homogenous in that all of them had governmental insurance and tends to use similar medications. Non-adherence among schizophrenic patients might be inherent in the context of the disease itself. Despite these limitations, results of this study were useful in understanding adherence, satisfaction and psychiatric symptoms.

ReferencesAdmin2010-12-25T10: 45: 00

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Al-Zakwani IS, Barron JJ, Bullano MF, Arcona S, Drury CJ, Cockerham TR. Analysis of healthcare utilization patterns and adherence in patients receiving typical and atypical antipsychotic medications. Curr Med Res Opin. 2003; 19(7): 619-26.

Arana GW: An overview of side effects caused by typical antipsychotics. J Clin Psychiatry 2000; 61: 5-11

Atkinson MJ, Kumar R, Cappelleri JC, Hass SL: Hierarchical construct validity of the treatment satisfaction questionnaire for medication (TSQM version II)

among outpatient pharmacy consumers. Value Health 2005, 8(Suppl 1): S9-S24.

Atkinson MJ, Sinha A, Hass SL, Colman SS, Kumar RN, Brod M, Rowland CR. Validation of a general measure of treatment satisfaction, the Treatment Satisfaction Questionnaire for Medication (TSQM), using a national panel study of chronic disease. Health Qual Life Outcomes. 2004 Feb 26; 2: 12

Awad AG, Voruganti LN. Impact of atypical antipsychotics on quality of life in patients with schizophrenia.. CNS Drugs. 2004; 18(13): 877-93. Review

Bharmal M, Payne K, Atkinson MJ, Desrosiers MP, Morisky DE, Gemmen E. Validation of an abbreviated Treatment Satisfaction Questionnaire for Medication (TSQM-9) among patients on antihypertensive medications. Health Qual Life Outcomes. 2009 Apr 27; 7: 36

Borras L, Mohr S, Brandt PY, Gilliéron C, Eytan A, Huguelet P. Religious beliefs in schizophrenia: their relevance for adherence to treatment. Schizophr Bull. 2007 Sep; 33(5): 1238-46

Breen A, Swartz L, Joska J, Flisher AJ, Corrigall J. Adherence to treatment in poorer countries: a new research direction? Psychiatr Serv. 2007 Apr; 58(4): 567-8

Byrne MK, Deane FP, Caputi P. Mental health clinicians' beliefs about medicines, attitudes, and expectations of improved medication adherence in patients. Eval Health Prof. 2008 Dec; 31(4): 390-403

Cabeza IG, Amador MS, Lopez CA, Chavez MG: Subjective response to antipsychotics in schizophrenic patients: clinical implications and related factors. Schizophr Res 2000; 41: 349-355

Campbell M, Young PI, Bateman DN, Smith JM, Thomas SH The use of atypical antipsychotics in the management of schizophrenia.. Br J Clin Pharmacol. 1999 Jan; 47(1): 13-22. Review

Clinical and resource-use outcomes of risperidone long-acting injection in recent and long-term diagnosed schizophrenia patients: results from a multinational electronic registry. Curr Med Res Opin. 2009 Sep; 25(9): 2197-206

Cost-sharing effects on adherence and persistence for second-generation antipsychotics in commercially insured patients. Manag Care. 2010 Aug; 19(8): 40-7

Damen J, Thuresson PO, Heeg B, Lothgren M. A pharmacoeconomic analysis of compliance gains on antipsychotic medications. Appl Health Econ Health Policy. 2008; 6(4): 189-97.

De Hert M, McKenzie K, Peuskens J. Risk factors for suicide in young people suffering from schizophrenia: a long-term follow-up study. Schizophr Res. 2001 Mar 1; 47(2-3): 127-34

Dingemans PM, Linszen DH, Lenior ME, Smeets RM. Component structure of the expanded Brief Psychiatric Rating Scale (BPRS-E). Psychopharmacology (Berl). 1995 Dec; 122(3): 263-7

Dolder CR, Lacro JP, Dunn LB, Jeste DV. Antipsychotic medication adherence: is there a difference between typical and atypical agents? Am J Psychiatry. 2002 Jan; 159(1): 103-8. Erratum in: Am J Psychiatry 2002 Mar; 159(3): 514

Dolder CR, Lacro JP, Jeste DV. Adherence to antipsychotic and nonpsychiatric medications in middle-aged and older patients with psychotic disorders. Psychosom Med. 2003 Jan-Feb; 65(1): 156-62.

Dolder CR, Lacro JP, Leckband S, Jeste DV. Interventions to improve antipsychotic medication adherence: review of recent literature. J Clin Psychopharmacol. 2003 Aug; 23(4): 389-99. Review

Fenton WS, Blyler CR, Heinssen RK: Determinants of medication compliance in schizophrenia: empirical and clinical findings. Schizophr Bull 1997; 23: 637-651

Fleischhacker WW, Oehl MA, Hummer M. Factors influencing compliance in schizophrenia patients. J Clin Psychiatry. 2003; 64 Suppl 16: 10-3

Freudenreich O, Cather C, Evins AE, Henderson DC, Goff DC. Attitudes of schizophrenia outpatients toward psychiatric medications: relationship to clinical variables and insight. J Clin Psychiatry. 2004 Oct; 65(10): 1372-6

Fujikawa M, Togo T, Yoshimi A, Fujita J, Nomoto M, Kamijo A, Amagai T, Uchikado H, Katsuse O, Hosojima H, Sakura Y, Furusho R, Suda A, Yamaguchi T, Hori T, Kamada A, Kondo T, Ito M, Odawara T, Hirayasu Y. Evaluation of subjective treatment satisfaction with antipsychotics in schizophrenia patients. Prog Neuropsychopharmacol Biol Psychiatry. 2008

Gharabawi GM, Greenspan A, Rupnow MF, Kosik-Gonzalez C, Bossie CA, Zhu Y, Kalali AH, Awad AG. Reduction in psychotic symptoms as a predictor of patient satisfaction with antipsychotic medication in schizophrenia: data from a randomized double-blind trial. BMC Psychiatry. 2006 Oct 20; 6: 45

Gianfrancesco FD, Rajagopalan K, Sajatovic M, Wang RH. Treatment adherence among patients with schizophrenia treated with atypical and typical antipsychotics. Psychiatry Res. 2006 Nov 15; 144(2-3): 177-89. Epub 2006 Sep 27.

Gibson TB, Jing Y, Kim E, Bagalman E, Wang S, Whitehead R, Tran QV, Doshi JA.

Gutiérrez-Casares JR, Cañas F, Rodríguez-Morales A, Hidalgo-Borrajo R, Alonso-Escolano D. Adherence to treatment and therapeutic strategies in schizophrenic patients: the ADHERE study. CNS Spectr. 2010 May; 15(5): 327-37.

Haddad PM, Taylor M, Niaz OS. First-generation antipsychotic long-acting injections v. oral antipsychotics in schizophrenia: systematic review of randomised controlled trials and observational studies. Br J Psychiatry Suppl. 2009 Nov; 52: S20-8.

Herings RM, Erkens JA. Increased suicide attempt rate among patients interrupting use of atypical antipsychotics. Pharmacoepidemiol Drug Saf. 2003 Jul-Aug; 12(5): 423-4.

Hofer A, Kemmler G, Eder U, Edlinger M, Hummer M, Fleischhacker WW. Quality of life in schizophrenia: the impact of psychopathology, attitude toward medication, and side effects. J Clin Psychiatry. 2004 Jul; 65(7): 932-9

Hui CL, Chen EY, Ka