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Reducing Polypharmacy

Gladys A. Ndege

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In partial fulfilment of the requirements

For the degree of

Master of Science

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PERMISSION

Title: Reducing polypharmacy

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Degree: Master of Science

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Abstract

Mental illness is major condition that is typically accompanied by other conditions; physiological or pathological. According to the National Institute of Mental Health (2016), nearly one in five U.S. adults' lives with a mental illness (44.7 million in 2016). Mental illnesses include different conditions that vary in degree of severity, ranging from mild to moderate to severe. Each condition or diagnosis given to a patient requires treatment with medications thus leading to polypharmacy. Polypharmacy is a concern for those patients who have more than one diagnosis with an existing mental illness. Gnjigic et al. (2012) described Polypharmacy as, the use of multiple medicines and/or the administration of more medicines than it is clinically indicated. This paper is going to examine a case report that will highlight the use of many medications and how they affect the treatment of a mental health patient with other co-morbidities. This will show how polypharmacy can lead to metabolic changes in the body and other issues. An extensive review was done using electronic databases including: CINAHL, PubMed, MedlinePlus, and PsycINFO. Search results are limited to the full article, English only and within the last 10 years. The search also includes the definition of polypharmacy, the nature of polypharmacy, and the effects associated with polypharmacy with mental health and co-morbidities. This paper will create awareness and understanding of the negative effects associated with polypharmacy, promote and encourage providers to assess patients' medications during visits, and prevent polypharmacy.

Reducing Polypharmacy

This paper is going to examine a case report that will highlight the use of many medications and how they affect the treatment of a mental health patient with other comorbidities. This will show how polypharmacy can lead to metabolic changes in the body and other issues. An extensive review was done using electronic databases including CINAHL, PubMed, MedlinePlus, and PsycINFO. Search results are limited to the full article, English only and within the last 10 years. The search also includes the definition of polypharmacy, the nature of polypharmacy, and the effects associated with polypharmacy with mental health and comorbidities. This paper will create awareness and understanding of the negative effects associated with polypharmacy, promote and encourage providers to assess patients' medications during visits, and prevent polypharmacy. **Reducing Polypharmacy in Mental Health Patients with Comorbidities**

The use of more than one medication in treating patients with one or many diagnoses has become a major issue that has led to the patient being non-compliant to medication due to the side effects that come with the use of medications. For example, a patient with a mental health issue manifest with other symptoms that can be easily treated with one kind of medication at first, but then the patient develops side effects from the medication, needing another intervention to the side effect, thus, requiring two medications for one condition. Most of the mental health patients present two or more symptoms, sometimes providers can treat them with one medication and sometimes a patient may need more than two medications or may have other medical diagnoses that require medications. Gnjigic et al. (2012) described polypharmacy as, the use of multiple medicines and/ or the administration of more medicines than it's clinically indicated;

While John et al. (2012) describes polypharmacy as the use of two or more medications to treat the same condition, which could be two or more drugs of the same chemical class or use of two or more drugs with similar pharmacological actions to treat different conditions in the same patient.

According to Gokula & Holmes (2012), polypharmacy is defined as, the use of multiple medications or duplicative medications that cause an increased risk for drug-drug and drug-disease interactions. And that polymedicine or polytherapy describes the use of multiple medications prescribed appropriately for treating multiple comorbid conditions (Gokula & Holmes 2012). Most patients with mental health issues also have comorbidities that need medical treatment. This can take a toll on the patient. A patient may take multiple medications for multiple issues; not only does a patient take prescribed medications but also tend to take over the counter medications which include vitamin and herbal supplements.

According to John et al. (2012), In general, patients at greatest risk of problems associated with polypharmacy include the elderly, those with four more recorded diagnoses, five or more medications, visiting multiple prescribers, use of multiple pharmacies, and use of nonprescription medications, herbs, or nutritional supplements. There is a need for providers to intervene to prevent polypharmacy. Reviewing the patient's medications is crucial. Each provider can and should review patients' medications at each visit by asking open-ended questions, asking the patient to bring in all the medication bottles that they are taking, including herbal, vitamins and dietary supplements. The provider needs to teach and promote patients on the possible interactions that can happen when taking herbal and dietary supplements. Most

patients do not consider herbal and dietary supplements as medications, so it is important for the provider to have this discussion to reduce polypharmacy problems with the patient.

A patient with mental health severity and comorbid tends to receive more than two or more medications. This can be associated with medication noncompliance and adherence, medication errors, and can lead to adverse drug reactions and drug-drug interactions.

Polypharmacy is associated with the increased fall risks for two main reasons: as a marker of underlying comorbidity, the more medications a patient is taking, the more likely it is that one of them will be a high-risk medication such as a long-acting benzodiazepine (Masnoon, Shakin, Kalisch-Ellett, & Caughey, 2017).

The purpose for this study is to bring awareness to clinicians to do a thorough medication review with patients during visits in clinics, during hospitalizations, and in any setting that they might be in contact with patients to help decrease polypharmacy. Pharmacists and all medication prescribers need to have a better way of monitoring the number of medications prescribed for an individual and provide education on medications and side effects to their patients. There is a need for providers to balance and match the complexity of a patient's condition and medications. Providers need to educate patients on other available alternatives to medications, such as eating whole foods and well-balanced diets with a lot of fruits and vegetables and exercising. Patients should be guided to use different therapies to improve their health, both mentally and physically, rather than depending on medications, especially vitamins and other supplements. Providers should also remember that polypharmacy is not always effective or safe and can potentially lead to inappropriate use of drugs, poor compliance, increased costs, and high risks of morbidity. All medications have side effects and drug-drug interactions (Hofer-Diickelmann, 2012).

Case Study

Presenting patient problem: Follow up after hospital discharge and establishing care

History of present psychiatric illness: R. O is a 59-year old female who presents to the clinic for follow up after being hospitalized for two weeks. R. O was admitted for increased depression symptoms. R. O reported that she is feeling a “little better” but is still experiencing depression symptoms. Reported symptoms are low energy, loss of interest with things she used to enjoy, isolation in her apartment, and sleeping “too much”. She denied feeling hopeless or worthless. She denies thoughts of harm to herself or others. Appetite is normal. Reported of baseline racing thoughts and distractibility continue. She denies increased energy. Low if anything.

Posttraumatic stress disorder/anxiety: R.O. reported continued anxiety, worrying a lot throughout the day and feelings of restlessness. Practicing radical acceptance. Denied panic attacks. The patient was alert and oriented X3, flat affect, poor eye contact neatly groomed.

Psychiatric history: R.O. carries a diagnosis of major depression disorder, bipolar disorder II, Posttraumatic Stress Disorder, and generalized anxiety disorder. Other previous diagnoses include neurocognitive disorder and substance use disorders. According to her record, the patient has been classified as having treatment resistance in the past. She has had numerous previous psychiatric admissions. She has been under full commitment with orders to have Electroconvulsive treatment (ECT) through Hennepin County, which was petitioned for during her last admission.

History of medication trials: She has had previous medication trials, including depakote, risperdal, geodon, clozaril, haldol, tegretol, lithium, remeron, prozac, adderall,

wellbutrin, ativan, and klonopin, briefly in the past. The patient also has been treated numerous times with her last trial was during her last admission in the inpatient hospital.

Individual or group therapy interventions: Patient-reported that she has completed the Dialectal Behavior Therapy series twice, Cognitive Behavior Therapy once, and individual therapy; doing light therapy daily. The patient stated that none of them seemed to help for a long time.

Prior psychiatric hospitalizations: Patient-reported that she has been hospitalized several times, and some of which she cannot remember. Her two recent hospitalization include Abbott Northwestern and Hennepin County Medical Center where she was hospitalized for about three months and received 14 series of ECT.

Review of pertinent medical: Patient medical diagnosis includes diabetes type II, Anemia, Hypertension and Neuropathy.

Social history: Patient was born and raised in Rochester Minnesota. She lives alone in her apartment. She is divorced and has two grown children. She reported being closer to her sister, who is her legal guardian. She is the fifth of eight siblings. She has a personal trust that provides for her financially. She has a degree in English Literature from the University of Minnesota. She denied having any legal issues. She has no history of military service and does not have access to weapons in her current living environment.

Other diagnostic testing, laboratory values/testing: No labs were ordered during the visit. The patient had a copy of her hospital discharges labs were within normal range except for her A1c that was 10. Current and past substance use/treatment: the patient history of marijuana and alcohol use. Reported 20 years of sobriety.

Vital Signs: Temp. 98.8, HR 57, BP 98/52 RR 16 FSBS per patient 112

Current Medications

-metformin 1000 mg tablet takes 1 tablet po 2 times daily with meals

-seroquel 200mg qhs

-losartan 50 mg po daily

-gabapentin 300 mg TID

-insulin glargine 30 units SQ qhs

-multivitamin daily

-iron sulfate 325 mg BID

-abilify 10mg daily

-lithium ER 750mg

-trileptal 600mg q am and 600 at bedtime

-prozac 80mg daily

-buspar 30mg bid

-hydroxyzine 25mg up to tid

Review over your diagnostic formulation

After reviewing the diagnosis, the patient's current diagnoses are appropriate, I would add Persistent Depressive Disorder because patient meets criteria.

Differential diagnosis: Unspecified depressive disorder and generalized anxiety disorder

Plan: A plan was developed in R. O's best interest based on her psychiatric diagnosis.

Medications reviewed were steered towards reducing polypharmacy in this patient. After a lengthy discussion on polypharmacy, on each medication, the potential side effects, and drug-

drug interactions and other risks, R.O, and the care team agreed on a trial of slowly weaning R.O off some of the medications. R.O requested for a complete washout of medications and start of an intensive therapy program. Reduction of polypharmacy was initiated starting with decreasing Seroquel to 100 mg and Prozac to 60 mg tapering to avoid triggering withdraw symptoms, intensive therapy was ordered including psychotherapy, DBT and use of sunlamp to help with her symptoms. R.O. was encouraged to follow up with her primary provider to discuss her blood pressure and her glucose levels as she has maintained her blood sugars under 120. R.O was advised to work on her diet as this also impacts her mood and general health. R.O was provided a list of symptoms to look for while reducing her medications and was also given several crisis phone numbers to call when in a situation that cannot wait to see her provider. R.O was advised to go to the emergency room immediately if experiencing suicidal thoughts and ideations with a plan. The patient is to return to the clinic in two weeks for re-evaluation and further medication decreases if no side effects noted.

Patients educated on common medication side effects, including antihypertensive that can cause fatigue, high doses on antidepressants that can cause weight gain, fatigue, and constipation were discussed. In Masnoon, Shakib, Kalisch-Ellett, & Caughey (2017), polypharmacy is associated with adverse outcomes including mortality, falls, adverse drug reactions, increased length of stay in the hospitals, and readmission. The risk of adverse effects and harm increases with numbers of medications and the possible adverse effects that the medication can cause. Providers prescribing medications need to consider the interactions among antipsychotics and other drugs with emphasis on potential interactions involving metabolic inhibition of the cytochrome P450 (CYP) enzyme system. Some atypical antipsychotics, such as clozapine,

risperidone, and quetiapine, are substrates of CYP isoforms such as CYP1A2, 3A4 and 2D6. (Gareri et al., 2006).

A Review of Literature

A literature review was conducted to determine the best way to reduce the patient's polypharmacy situation. A search was conducted using the University of North Dakota Harley French Library website. An extensive systematic research of the literature was reviewed and conducted using the electronic databases including CINAHL, PubMed, MedlinePlus, and PsycINFO. Search terms used included: the definition of polypharmacy, polypharmacy, mental illness, polypharmacy mental health, treatment, schizophrenic, advance drug reactions and polypharmacy, and consequences of polypharmacy. Hundreds of articles were received, the search was then narrowed down with limitations of the full article, English only, and within the last 10 years. The research generated limited articles with links that were not available. Articles with the review of the literature (ROL), were chosen based on the implementations.

Ortiz, Hollen, & Schacht (2016), conducted a study that had a comparison of patients discharged from state inpatient hospitals in comparison to those discharged from other psychiatric inpatient hospitals to understand the fact that contributed to polypharmacy and gain insight into the quality initiatives that could further reduce the use of antipsychotic polypharmacy. The study composed and analyzed data from 86,034 discharges, from 160 state psychiatric inpatient hospitals in 46 states and territories during the calendar year 2011. (Ortiz, et al., 2016). This study examined antipsychotic prescribing practices for all discharged adults, without preselection by diagnosis. In their study Ortiz, et al. (2016) stated that to gain a better understanding of antipsychotic polypharmacy, that the rates of polypharmacy were calculated in

two ways. The prevalence or unadjusted antipsychotic polypharmacy rate was calculated as the number of discharges in which antipsychotic polypharmacy was prescribed and divided by the total number of discharges during a given period. The unadjusted polypharmacy rate therefore includes patients who have not prescribed any antipsychotic medications in the denominator.

Ortiz et al. (2016) further indicated that of the patients discharged, 32% were not prescribed an antipsychotic medication at discharge, 56% were prescribed antipsychotic monotherapy, and 12% (unadjusted rate) was a prescribed antipsychotic polypharmacy. Of the patients discharged with at least 1 antipsychotic medication, 18% were discharged on an antipsychotic polypharmacy (adjusted antipsychotic polypharmacy rate). The report further stated that a study done by the Joint Commission (TJC), revealed that the adjusted antipsychotic polypharmacy rate reported has decreased from 15% in 2011 to 13% in 2013 across nearly 600 psychiatric hospitals and that the Centers for Medicare & Medicaid Services (CMS) provided its first reporting of the adjusted polypharmacy rate, for 2013 at 11% for adults 18 to 64 years of age across >1600 psychiatric hospitals. Most of the patients that are reported to have high polypharmacy are those diagnosed with schizophrenia, who have had several medications trials and failed.

The goal is to keep the patient's symptoms managed, monotherapy has not been successful in the past, but there is a push for providers to find ways that can help reduce polypharmacy. This can be done by physician discussions in grand rounds, the avenue for further understanding the rationales for medication choices as well as polypharmacy. Physician consultation may be another avenue for developing strategies to reduce the number of

antipsychotic medications during the hospitalization while maintaining functioning (Ortiz et al., 2016).

Another study conducted by Wu, Bruns, Tai, Lee, Raghavan, dosReis (2018) examined differences in psychotropic polypharmacy among youths with serious emotional and behavioral disorders who received coordinated care services (CCS) that used a wraparound model, and a matched sample of youths who received traditional services. The study used the quasi-experimental design comparing psychotropic polypharmacy for one year before and one year after discharge from coordinated care services (CCS). The study was carried over a five-year period starting from December 2009 through May 2014. The study reported that the reduction of polypharmacy for one year before CCS enrollment to one year after discharge was 28% for the CCS and 29% for the non-CCS group, a non-significant difference.

Schuman-Olivier, Noordsy, & Brunette (2013) conducted a study to determine strategies for reducing antipsychotic polypharmacy. Their study involved a young adult with co-occurring disorders, presenting with treatment-resistant psychotic and mood disorder symptoms and experiencing intolerable side effects from substantial polypharmacy (Schuman-Olivier et al., 2013). The study shows how other interventions can be implemented by educating patients on the use of available nonpharmacological therapies and strategies to address their symptoms than merely relying on medications to help with their symptoms. In the study, the authors pointed out the incorporation of mindfulness training which includes the focus on developing nonjudgment of current experiences through a set of formal and informal mindfulness exercises (Schuman-Olivier et al., 2013). The authors also reported the use of exercise as one of the skills that have been proven to show that exercise improves fitness thus improving mental health. In this case

study, the authors reported that the client could tolerate a transition to antipsychotic monotherapy and a reduction in other medications while maintaining sobriety, losing weight, changing his or her relationship to his or her residual symptoms, and improving function at school and in his or her social life (Schuman-Olovier et al., 2013).

Shuman, Trigoboff, Delmer, & Opler (2014) conducted a study to explore the potential effect of polypharmacy on the hematologic profiles of clozapine patients. This study was used to examine data on clozapine recipients who experienced adverse drug reactions (ADRs) related to decreases in WBC or ANC and ascertain whether other drugs and/or drug interactions had played a role (Shuman et al., 2014). The presence of hematological ADRs and other groups of medications administered that were given in conjunction with clozapine were calculated using the Pearson correlation coefficients. Study findings show that autonomic agents, anti-infective agents, and proton pump inhibitors and other gastrointestinal agents were all associated with hematological ADRs when co-prescribed with clozapine (Shuman et al., 2014). The importance of creating awareness in antipsychotic polypharmacy reduction in patients with other comorbidity is important to prevent patients from having unnecessary and unwanted side effects of Agranulocytosis, gastrointestinal issues, and other medical issues that can be caused by polypharmacy.

Wimmer et al. (2014) conducted a study to investigate polypharmacy and medication regimen complexity as factors associated with hospital discharge destination among older adults. The prospective cohort study was to determine why older adults often take multiple medications and why three-quarters of nursing home placements in the USA are preceded by hospitalization. The study sample of patients was aged over 70 years and was consecutively admitted to the

geriatric for evaluation and Management unit. Of 166 eligible participants, 163 participants were included in the study. The study revealed that polypharmacy, which is often used as a surrogate for inappropriate medication use, was not associated with discharge destination by the authors. Clinical implications of the findings include the potential importance of reducing complexity when possible.

A systemic study review was conducted by Takeuchi, Suzuki, Remington, & Uchida, (2015) to determine the correlation between antipsychotic polypharmacy and QT Interval. The authors in their review identified a total of 21 studies and conducted an observational study which examines the use of antipsychotic polypharmacy and related the measure associational for the QTc interval. The result of the review from all four observation studies was identified. They revealed that a combination of treatment with two or more antipsychotic and other comorbidity medications will cause QTc in the patient. An example of the medications includes the combination of ziprasidone or sertindole combined with clozapine may prolong QTc interval.

Hazra et al. (2011) conducted a systematic review on reducing antipsychotic polypharmacy in schizophrenia in New York City in 2006 and 2008. The authors stated that a cross-sectional study with a prescription for schizophrenia was reviewed to determine the prevalence and pattern of polypharmacy prescription and pattern. The study indicated that prompts from pharmacists or pharmacy systems were effective in changing a variety of prescribing practices. In their study, the inpatient and outpatient pharmacies used a single pharmacy database where prescription information is entered and stored for all the patients that were being monitored. The pharmacist notified the prescribing provider when antipsychotic polypharmacy was detected during drug prescription to review his orders. The study included

648 and 778 patients enrolled in the Schizophrenia Program in 2006 and 2008. The results were analyzed perceptively and reported a three-fold decrease in the prevalence of antipsychotic polypharmacy (18.3% [118/648] in 2006 vs 6.6% [51/778] in 2008). The study reported a decrease of three antipsychotic combinations from 5.3% (2006) to 0% (2008). This study showed a decrease in polypharmacy. Prescribers were alerted with patients that were on three or more medications and this required the prescribers to address the polypharmacy and attempt to reduce the number of medications. In the end, polypharmacy was reduced to monotherapy. The authors caution a need for more evidence-based studies in the future.

Another systematic review study was conducted by Tani, Uchida, Suzuki, Fujii, Mimura (2013). The study was performed to identify studies that have been attempted to reduce antipsychotic polypharmacy in patients with schizophrenia as a main interest by any form of systematic interventions. According to the authors, the objective of the study was to synthesize the evidence on trials that attempted to reduce antipsychotic polypharmacy, defined as the simultaneous use of multiple antipsychotic drugs, in a systematic fashion for patients with schizophrenia. 17 studies were identified through the literature search, three of which were clinical trials that systematically switched antipsychotic polypharmacy to monotherapy and 14 examined the impact of interventions to have a physician refrain from antipsychotic polypharmacy. The study revealed that antipsychotic polypharmacy can be reduced through physician prescribing habits with a focus on other interventions rather than routing educations.

A prospective cohort study was conducted in the veteran's home by Yeh, Liu, Peng, Lin & Chen (2012) to determine the potential benefits of reducing medication-related to an anticholinergic burden for demented older adults. Authors in their view identified 67 demented

patients. 53 out of the 67 completed the study. 38 participants (56.7 % at baseline), in which antipsychotics (n=29, 76.3%) and antidepressants (n=19, 50%) were the most common agents. Educational status, comorbid diseases, medication use, cognitive status, and physical function were recorded by research staff during the two-week period before the intervention. The programs selected for use included the educational intervention program which was designated to reduce the overall use of anticholinergics medications by improving the selection of drug use (Yeh et al., 2012). The authors addressed the issues by comparing the study with participants in the reference group, Clinician-Rated Anticholinergic Score (CR-ACHS,) were significantly reduced in the intervention group at the 12-week follow up, whereas the mean Mini-Mental State Examination and Barthel Index were similar between groups. The result of their view from the comparison was identified and revealed that reducing anticholinergic polypharmacy can be done successfully and safely through an education program for prescribers.

Pitkala et al. (2012) conducted a study to investigate the effect of educating staff in reducing the use of inappropriate drugs among residents and effects on residents' quality of life and in an institutionalized setting on the harm of related older people's drug treatment. According to Pitkala et al. (2012), Polypharmacy and use of an inappropriate drug are very common among frail institutionalized residents. The authors continue to argue that polypharmacy is a challenge for clinicians because it is associated with a risk of drug-drug interactions and adverse side effects. To try and reduce polypharmacy in institutionalized settings, efforts need to be made to identify individuals at risk for multiple psychotropic medications and implement specific strategies that can to enable clinicians and staff in identifying adverse drug reactions associated with psychotropic polypharmacy.

Implications

According to English et al. (2012), Drug-Drug Interactions (DDI) from psychotropic medications can result in poor tolerability and/or reduced efficacy impacting the clinical outcomes of patients. Most DDIs involving psychotropic medications are pharmacokinetic (vs. pharmacodynamic), involving the CYP450 isoenzyme family. Therefore, prescribers need to perform an extensive assessment of medications that a patient is taking including vitamins and supplements to eliminate unnecessary side effects and drug to drug interactions. Advocating for antipsychotic monotherapy to reducing polypharmacy. New medications added to existing pharmacotherapy regimens should be initiated at a low dose and titrated slowly (English et al., 2012).

Improvements in pharmacogenetic testing may aid the PCP by promoting individualized pharmacotherapy selections and improve patient outcomes (English et al., 2012). Providers should educate the patient on pharmacogenetic testing, to help prevent several trials of medications that may not be appropriate for the patient and avoid polypharmacy. Doctors, nurse practitioners, and other prescribers can improve patient outcomes by considering DDI potential of psychotropic medications and monitoring concomitant therapy during treatment to avoid potential drug-drug interactions before a patient takes the medications (English et al., 2012).

There is little evidence-based research on polypharmacy in mental health. A need for more research would be beneficial to determine and support providers and patients with how to prevent polypharmacy while keeping the patient safe. The knowledge acquired about the relationship among pre-existing and co-existing diseases and polypharmacy might help to

identify problems in specific groups of elderly people and monitor the treatment of patients who are at risk of polypharmacy (Hofer-Diickelmann, 2012).

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