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The Use of Financial Incentives to Increase Patient Compliance with Antipsychotic Medication

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Patient noncompliance with medications (PNM) is an ongoing issue. PNM is costing society billions of dollars and decreasing the patients' quality of life (Berg, Dischler, Wagner, & Palmer-Shevlin, 1993). An estimated 50% of people suffering from schizophrenia are noncompliant with their medication regime (Perkins, 2002). Different interventions have been tried to decrease PNM and it seems none have been successful. I propose to decrease PNM to antipsychotics in the following study by introducing a financial incentive to the experimental group. PNM will be measured by checking the level of antipsychotic medication in the blood to determine if the patient has been correctly taking their prescribed medication. The goal of this experiment is to determine if a financial incentive will increase PNM.

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One major issue in the healthcare field has been patient noncompliance with medications (PNM). Medication compliance is defined as taking a prescribed medication according to the instructions given to the individual, taking into consideration the correct time, dosage and how often they need to take it (Cramer et al., 2008). The effectiveness of a treatment is determined by how long and how well patients take their medications (Cramer et al., 2008). PNM affects both the patient and society from excessive hospitalizations to unnecessary expenditures that can be out of pocket or through health insurance companies (Berg, Dischler, Wagner, & Palmer-Shevlin, 1993). PNM can also negatively affect the patients' quality of life by shortening their life span, decreasing their ability to perform activities of daily living such as bathing and eating, having unwanted symptoms that can disrupt their relationships and work, and not being able to enjoy a normal life. An estimated \$80 billion could be saved if the problem of noncompliance in general can be diminished (Berg et al., 1993).

Noncompliance is an issue with many illnesses, but people with schizophrenia have a high rate of PNM. Schizophrenia is a common disorder affecting 1% of the world affected by PNM, with 10% of schizophrenics committing suicide (Andreasen, 2000). For a diagnosis of schizophrenia, the DSM-V suggests that people must have two or more of the

following symptoms: delusions, hallucinations, disorganized speech, or catatonic behavior and negative symptoms (American Psychiatric Association, 2013). Schizophrenia must affect one or more areas of life such as work or self-care and it must last for more than 6 months (American Psychiatric Association, 2013). Legal or illegal substances and other psychiatric and medical conditions should be ruled out as the cause of symptoms as well (American Psychiatric Association, 2013). Symptoms of schizophrenia are split into two categories, positive and negative symptoms. Some positive symptoms are hallucinations and delusions, problems with perception, disorganized speech, unorganized behavior, and issues with controlling behavior (Andreasen, 2000). Some of the negative symptoms are the inability to set and pursue goals, the inability to feel pleasure and attentional impairment (Andreasen, 2000). Schizophrenics are not able to enjoy a normal life. A portion of schizophrenics are not able to go to work or school and do not interact in society (Andreasen, 2000).

An estimated 50% of schizophrenics do not comply with their medications (Perkins, 2002). Non-adherence to antipsychotics costs society \$33-\$65 billion a year (Dolder, Lacro, Dunn, & Jeste, 2002). Schizophrenic patients who were non-adherent, partially adherent, or excess prescription fillers were more likely to be hospitalized compared to individuals who were adherent to their medications (Gilmer et al., 2004). Side effects are the major reason many schizophrenics do not take their medication (Berg et al., 1993; Day et al., 2005; Dolder,

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Lacro, Dunn, & Jeste, 2002; Fenton et al., 1997; Gray, Wykes, & Gurnay, 2002). The most severe side effect is akathisia, a neurological disorder which causes the person to be restless (Fenton et al., 1997). Other barriers to PNM would be limited time with healthcare provider to talk about concerns regarding treatment, poor communication, and forgetting to take medications due to the complex medication regime (Berg, Dischler, Wagner, & Palmer-Shevlin, 1993; Fenton et al., 1997). As the severity of the illness increases, PNM increase due to disorganization, hostility and suspiciousness of the individual (Fenton et al., 1997). Other reasons why patients do not take their medication is due to a co-occurring alcohol and drug problem or the patient believing they do not need the medication or that it is not effective (Fenton et al., 1997).

There are two classes of antipsychotic medications: typical and atypical antipsychotics. According to one study, patients had higher compliance rates to atypical medications as compared to typical medications until 12 months into the experiment, when there was no difference between the two groups' compliance rates (Dolder, Lacro, Dunn, & Jeste, 2002). Atypical medications were thought to increase compliance due to having less severe side effects as compared to typical medications (Mortimer, Williams, & Meddis, 2003). Atypical medications had lower rates of medication adherence due to weight gain and a decreased interest in sex (Mortimer et al., 2003; Valenstein et al., 2004). Unfortunately the atypical and typical medications are the only medications available for management of schizophrenia so they need to be taken to increase patients' quality of life by decreasing symptoms.

Schizophrenics taking clozapine were not excluded in many studies because patients were required to have weekly or bi-weekly checkups so adherence rates were higher as compared to other antipsychotic medications (Dolder, et al., 2002; Valenstein et al., 2004). Clozapine is an atypical medication that is closely monitored with a blood test (Dolder et al., 2002; Valenstein et al., 2004). Other antipsychotic medications are not as closely monitored because they do not have as many side effects as clozapine, which is why patients were more likely to be compliant with their medication regime (Dolder et al., 2002; Valenstein et al., 2004). The most reliable adherence measure is the blood assay test because of the medication's relatively long half-life (Gray, Wykes, & Gournay, 2002). All antipsychotic medications can be measured through checking the level of the medication in the blood (Snyder, 1981). Other methods that have been tried to measure compliance are physicians' assessment and patients' self-report, pill counts and urine analysis, all of which have greater measurement errors than blood tests (Gray et al., 2002).

Many interventions have already been tried to decrease noncompliance with little to no avail. In three studies, educating schizophrenics on the importance of taking their medication did not decrease PNM to antipsychotic medications (Berg, Dischler, Wagner, & Palmer-Shevlin, 1993; Fenton, Blyler, & Heinssen, 1997; Gray et al., 2002). Another intervention focused on the physician having control over the patient such as restraints and

the ability to force medication on the patient (Kasper, Hoge, Feucht-Haviar, Cortina, & Cohen, 1997). This intervention occurred if the patient was to become a danger to themselves or others and it did increase compliance (Kasper et al., 1997). However with this intervention, physicians had too much power over their patients' and made the doctors insensitive to the patient's needs and was only useful in a hospital setting (Kasper et al., 1997). Compliance devices, such as alarms to let patients know when to take their medication was helpful to improve compliance by helping those patients who forgot to take their medications (Berg et al., 1993).

Furthermore, schizophrenics living with family members or lived in an assisted living facility were more likely to be adherent to medication since they had someone to remind them to take their medication (Gilmer et al., 2004; Fenton et al., 1997). Lack of coercion during the admissions process, a positive relationship with the prescriber, involvement of patient in treatment decisions, and a medication regimen that minimized adverse effects all had an effect in increasing compliance (Day et al., 2005). When patients are more involved and have the right to make their own decisions, PNM decreases (Gray, Wykes, & Gournay, 2002). Even with all these interventions that have been relatively effective, there is still a high rate of PNM.

Positive reinforcement have increased compliance in many studies (Donatelle, Prows, Champeau, & Hudson, 2000; Volpp et al., 2006; Volpp et al., 2009). One study gave financial incentives to clinics who met their predetermined success rate, which was gauged by the amount of patients who quit smoking (Roski et al., 2003). The study's results suggested that there was no significant effect of financial incentives given to clinics on the rate of patients smoking cigarettes (Roski et al., 2003). In contrast, other studies have suggested that participants are more likely to quit smoking cigarettes and have abstained from smoking when they themselves are presented with a financial incentive (Donatelle, Prows, Champeau, & Hudson, 2000; Volpp et al., 2006; Volpp et al., 2009). For example, pregnant women who are in WIC, a federally funded program for low-income women who are in need of financial assistance with their children were offered a \$50 voucher if they quit smoking (Donatelle et al., 2000). Results of this study suggested that women were more likely to quit smoking if they had a financial incentive (Donatelle et al., 2000). Incentives such as benefits coverage had been a factor for increased compliance to antipsychotic medications (Valenstein et al., 2004). However, in the study compliance was measured by prescription refill rates, which does not determine if the patients were actually taking their prescription correctly (Valenstein et al., 2004).

In one meta-analysis, 10 out of 11 studies that were examined demonstrated that medication compliance in general increased with the use of financial incentives (Giuffrida, & Torgerson, 1997). Likewise, quitting cigarette smoking with financial incentives has been successful in past studies. Thus the use of financial incentives may also decrease PNM in schizophrenic patients. The proposed study looks at the effect of

financial incentives on PNM. I predict that individuals who are receiving financial incentives will be more compliant in taking their prescribed antipsychotic medication than individuals who are in the no financial incentive group.

PROPOSED METHOD

Participants

Two-hundred participants will be chosen from newly diagnosed patients who are treated at outpatient psychiatric clinics. Participation will be voluntary via convenience sampling. They will then be assigned into one of two conditions.

Materials

Materials needed for this experiment will be a blood assay, which was found to be the most reliable form of measurement for antipsychotic medications (Gray, Wykes, & Gournay, 2002). The blood assay measures the level of the antipsychotic medication in the participant's blood (Snyder, 1981). Participants will be asked for a blood sample monthly starting one month after being on the prescribed dosage of the antipsychotic medication. Other materials needed for this experiment will be the consent and debriefing forms. Participants involved in the experiment will only be on one antipsychotic medication which will help control extraneous variables.

Procedure

Two-hundred participants will be randomly assigned to two groups, the experimental and control group. The research will be an experimental design. An ANOVA test will be done to compare means, with time as a within-subjects variable and incentives as a between-subject variable. The study will be double-blind. The independent variable that is being manipulated is the financial incentive and the dependent variable that is being measured is the therapeutic level of medication in the participants' blood. Treatment compliance is expressed by the therapeutic level of medication in the blood in this experiment. Every six months participants who are compliant in the experimental group will receive \$250. The whole experiment will take 36 months to complete.

First participants will obtain a consent form and will decide whether they would like to participate in the study. Participants will then have to read and sign the informed consent and then be asked demographic question to determine their gender. Participants' will take their antipsychotic medication as prescribed and come back in one month to have their blood drawn to check the levels of the antipsychotic medication in their system. Then participants will come once monthly afterwards for 35 more months to check the levels of the antipsychotic medication in their system which will be recorded.

CONCLUDING REMARKS

Significance

PNM is an issue that could be decreased in not only the schizophrenic population but across the board with different types of illnesses. Quality of living can increase and unnecessary expenditures in the healthcare industry can decrease. In one study, a total of \$22,936 per patient was saved with increased compliance to an antipsychotic drug (Meltzer, Cola, Way, Thompson, Bastani, Davies, Snitz, 1993). This was due to a dramatic decrease in the rate and costs of hospitalizations (Meltzer et al., 1993). Many interventions have already been tried and have not been successful so there is still a need for an intervention that can succeed where others have failed.

Limitations

This study focuses on newly diagnosed patients. Since these patients are newly diagnosed they may try to comply with the medication regime as prescribed or may not due to the side effects. Since some patients may have adverse effects to some medications, they may be switching medications till they find one suitable to them. Another limitation to this study is that it does not take into effect the severity of the illness and how that could affect PNM. The study also raises some ethical questions such as coercion into taking a medication that they do not want to or might not have the insight to understand why they are taking the medication (Claassen, 2007); may be pressured to continue for the money. Lastly, is it financially alright to use money in this way when it could be used for something else (Claassen, 2007).

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