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Do financial incentives increase treatment adherence in people with severe mental illness? A systematic review

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SUMMARY. **Aim** – To identify whether financial or material incentives improve treatment adherence in people with severe mental illness. **Method** – A systematic review of studies published between 1950 and 2008 was conducted. EMBASE, MEDLINE, EBM, AMED and PsycINFO were searched. Studies were included if a financial or material incentive was offered and if the sample had a severe mental illness. **Results** – Fourteen articles were identified; three studies on adherence to psychiatric treatment and one on physical exercise. Ten articles used incentives for adherence to substance misuse treatment programmes. In all studies, financial incentives were associated with an increase in adherence; however the effect was not always maintained once the incentive was withdrawn. **Conclusion** – While existing research suggests that financial incentives may improve treatment adherence in severely mentally ill populations, very few studies focus on psychiatric treatment. Further research may address the long term effectiveness of incentives on adherence in this population.

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KEY WORDS: patient non-adherence, health behaviour, review, systematic, incentives.

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INTRODUCTION

Non-adherence to medication and treatment programmes by people with mental health problems is particularly common (Fenton *et al.*, 1997; Lacro *et al.*, 2002; Nosé *et al.*, 2003) and is associated with a range of negative outcomes. It may result in poorer outcomes for the individual, for example, increased rates of relapse and re-hospitalisation, as well as increasing the burden on health services. The healthcare costs of patients with schizophrenia who do not adhere to medication are reportedly higher than the costs for those that do adhere (Gilmer *et al.*, 2004). It has been suggested that non-compliance

with treatment is a feature of at least a quarter of suicides and homicides by people with mental health problems (Appleby, 2000).

Several strategies such as compliance therapy, psychotherapy, family education, telephone prompting and psycho-education have been tested to improve adherence to maintenance antipsychotic medication. Studies show that they have at best, a limited effect (McDonald *et al.*, 2002; O'Donnell *et al.*, 2003). Adherence therapy, which aims to improve compliance with medication, is specifically not recommended for people with schizophrenia (National Institute of Clinical Excellence, 2009). Against this background, the question arises as to what initiatives may be effective in improving adherence to treatment.

Research conducted in the United States has shown that financial incentives can considerably improve adherence to treatment in a range of conditions. A systematic review found that 10 out of 11 randomised controlled studies using financial incentives described positive results for anti-tuberculosis drugs, dental care, weight

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reduction, cocaine dependence, and anti-hypertensive treatment (Giuffrida & Togerson, 1997). None of these studies were conducted with patients with psychiatric disorders; however a clinical trial is currently underway in the UK which seeks to examine the effectiveness of financial incentives on adherence to anti-psychotic maintenance medication (Priebe *et al.*, 2009).

Patient experiences of the use of leverage such as money or housing to improve adherence to treatment in psychiatric patients in the community have been explored (Monahan *et al.*, 2005). Half of the individuals reported that a form of leverage had been used to encourage adherence to treatment, with the provision of accommodation being the most commonly used incentive.

There has been some ethical debate over the use of financial incentives to achieve adherence in people with mental health problems. While financial incentives could be perceived as coercive (Shaw, 2007), others claim that they should be interpreted as a reward and could be viewed as less coercive than existing forms of leverage, such as enforced hospital admission (Burns, 2007). While this controversial debate is likely to continue for conceptual, ethical and practical reasons, the debate should be informed by evidence on the use of financial incentives for treatment adherence in severely mentally ill populations.

Aims of the study

To systematically review the existing published literature on whether financial or material incentives improve adherence to treatment in people with severe mental illness.

MATERIAL AND METHODS

An initial broad search for articles was undertaken to identify all studies where financial and material incentives have been used to achieve adherence to treatment in people with severe mental illness. Articles where financial or material incentives were offered to severely mentally ill patients to improve adherence to substance misuse treatment programmes were included in the review.

Relevant studies were located through a search of the following databases up to October 2008: EBM (1991+), PsychINFO (1950+), EMBASE (1980+), Medline (1950+) and AMED (1985+). The following search terms were combined simultaneously to identify relevant studies: 'incentive', 'money', 'payment' 'contingency management', 'voucher', 'financial' with the terms 'medication', 'therapy', 'appointment' 'compliance'

'adherence' and 'mental health', 'mental illness', or 'psychiatr' to identify studies specific to severely mentally ill populations.

The reference lists of relevant articles identified through this process were hand searched to identify any further research articles. All four authors of the mental health treatment specific articles were contacted to identify whether any other relevant studies existed. Three responded and identified no further studies beyond those included in this review. Ten key psychiatry journals including *Acta Psychiatrica Scandinavica*, *American Journal of Psychiatry*, *Archives of General Psychiatry*, *British Journal of Psychiatry*, *Journal of Clinical Psychiatry*, *Epidemiologia E Psichiatria Sociale*, *Psychopharmacology*, *Journal of Social Psychiatry and Psychiatric Epidemiology*, *Schizophrenia Bulletin* and *Psychiatric Services* were manually searched for relevant articles from the previous five years (January 2004–January 2009), but yielded no further results.

Papers were selected for inclusion in the review using the following criteria: the incentive had to be a direct offer of payment to an individual in the form of a monetary, voucher based or material goods value before they received treatment. The impact the incentive had on adherence had to be reported and participants had to be diagnosed with a severe mental illness. Data were extracted from each study by two research workers and compared to ensure reliability of the extraction tool. Where discrepancies appeared, these were discussed until a consensus was reached.

Due to the expectation that limited research would be found in this area, the inclusion criteria for study methodologies was not restricted to randomised controlled trials. A Meta Analysis was not conducted on the data, as it was anticipated that studies would be too heterogeneous with regards to the interventions, treatment settings, participant diagnoses, and outcomes measured. A descriptive synthesis of the results is therefore presented.

RESULTS

From the databases searched, 90 articles were retrieved for further screening (See Figure 1). Fifty-four articles were excluded as they referred specifically to people with substance misuse disorders with no other diagnosed mental health problem. A further 28 articles were excluded as the incentive was not of a financial or material value. Eight studies selected for inclusion were identified directly from the database search. In one of these studies (Messina *et al.*, 2003), participants either had a substance

misuse problem or a diagnosis of antisocial personality disorder (ASPD) and substance misuse problem. Only the outcomes from the ASPD group are taken into account for

the purposes of this review. The remaining six articles were identified through a manual search of the bibliographies from articles with a related title.

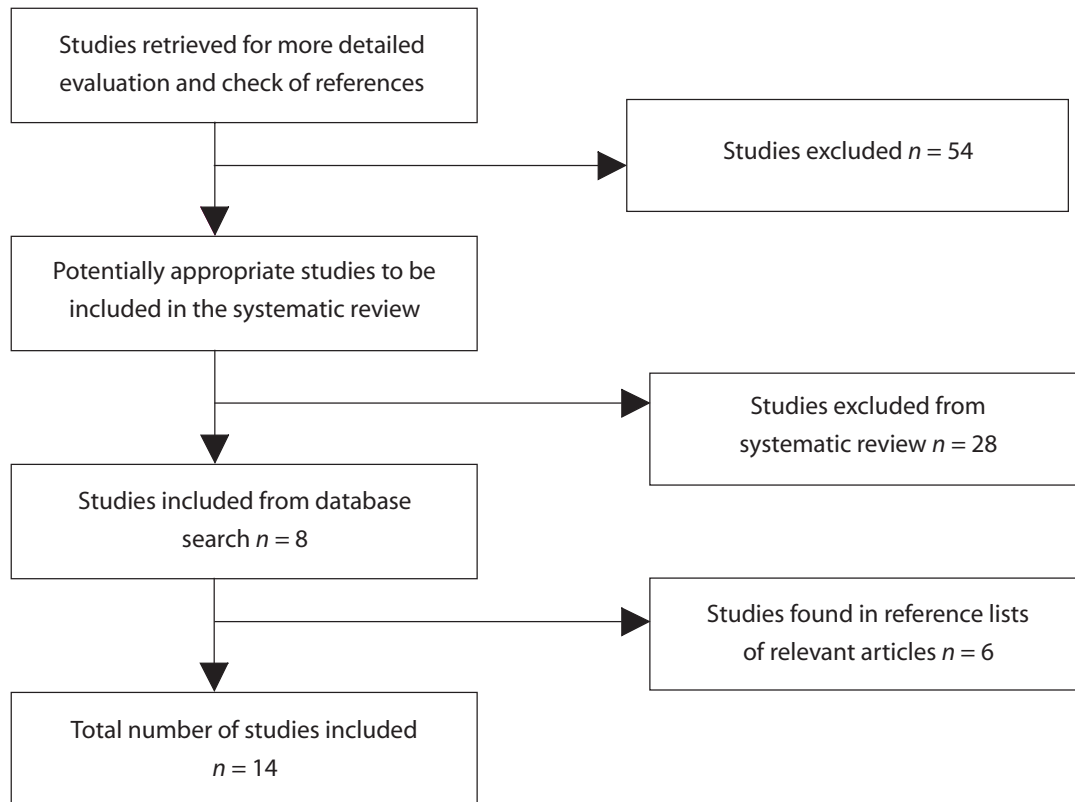


Figure 1 - QUOROM diagram.

From the 14 articles that met the inclusion criteria, three sought to encourage adherence to mental health specific treatments (Claassen *et al.*, 2007; Post *et al.*, 2006; Olson & Greenberg, 1979). This included adherence to depot medication for people with schizophrenia (Claassen *et al.*, 2007), attendance at therapy sessions for people with depression (Post *et al.*, 2006), and attendance and active participation in group meetings for people with schizophrenia and other disorders (Olson & Greenberg, 1979). One study aimed to encourage the uptake of physical exercise in people with schizophrenia (Thyer *et al.*, 1984). The remaining ten studies offered financial or material incentives to people with severe mental illness to encourage abstinence from substances and/or adherence to substance misuse treatment programmes. This included two studies on abstinence

from smoking in people with schizophrenia (Carey & Carey, 1990; Tidey *et al.*, 2002). See Tables I and II for study details.

Study Participants

Study participants were either outpatients, living in independent accommodation or hostels in the community, living in the community and accessing assertive outreach services, or psychiatric inpatients. In seven of the studies, participants were diagnosed with schizophrenia or other psychotic disorders. One study included people with depression (Post *et al.*, 2006) while another included people with ASPD (Messina *et al.*, 2003). In the remaining five studies, participants had a range of mental disorders.

Table 1 – Studies of Interventions with Severely Mentally Ill Patients.

Source	Design	Setting	Sample	Duration	Aim	Type of incentive	Outcomes	Maintenance of outcomes
Claassen <i>et al.</i> 2007	Case observation	Assertive Outreach Community Team London, UK	5 patients diagnosed with schizophrenia	Not reported	To evaluate the effect of incentive payments on adherence to medication (depot)	Money £5-£15, depending on the frequency of injection	1 patient refused 3 patients not re-hospitalised, 1 patient improved adherence but re-hospitalised	No follow up
Post <i>et al.</i> 2006	Time-series design A-B-A	University Mental Health centre (outpatients) USA	54 patients diagnosed with depression	36 weeks (12-12-12)	To evaluate the effect of incentive payments on attendance to therapy appointments	Money \$10 payment for every scheduled appointment of therapy attended	Adherence increased from 79% in the pre incentive period to 86% during the incentive period	Adherence to therapy sessions decreased from 86% in the incentive period to 69% once payments ended
Thyrer <i>et al.</i> 1984	Time-series design A-B-A-B	Group home - psychiatric care facility (inpatients) USA	5 patients with schizophrenia	28 weeks	To assess the effect of offering incentives on exercise	Material goods One cigarette, coffee or tea for each 1/10 mile pedalled during first mile, each 2/10 mile pedalled during second mile etc	Increased pedalling occurred during the intervention phases	Increased pedalling was maintained at follow up (50 days after the end of the intervention period)
Olson & Greenberg 1972	Controlled trial	Veterans Administration Hospital (inpatients) USA	52 patients with schizophrenia, 14 patients with organic disorders, 8 patients with other disorders	40 weeks (8-16-16)	To assess the effect of incentives on attendance and participation in two weekly patient government meetings	Money or vouchers Maximum amount a week = \$15	Incentive group spent more days on leave from hospital and had increased levels of attendance at scheduled activities	Outcomes were maintained at 16 week follow-up period after the intervention

Table 1 – Studies of Interventions with Severely Mentally Ill Patients.

Source	Design	Setting	Sample size	Duration (in Aim weeks)	Type of incentive	Outcomes	Maintenance of outcomes	
Tracy <i>et al.</i> 2007	RCT	Columbus House, community-based homeless shelter Connecticut, USA	30 homeless patients with current substance abuse and a DSM-IV diagnosis of an Axis I psychiatric disorder	4 weeks	To assess the effect of a contingency management (CM) approach on reducing alcohol and cocaine abuse	Prize bowl with redeemable prizes between \$0 and \$100 A minimum of \$22 and a maximum of \$91 was earned	Fewer days of cocaine use (F(1,27)=5.67, p=.02) and alcohol use (F(1,27)=6.83, p=.01) in the CM condition CM condition had significantly fewer alcohol positive breathalyzer samples (X ² (1)=14.75, p=.000)	No follow up
Drebing <i>et al.</i> 2005	RCT	Bedford Veterans centre USA	21 dually diagnosed veterans with a DSM IV Axis I psychiatric disorder	16 weeks	To evaluate the efficacy of adding CM initiatives to encourage attendance at compensated work therapy (CWT) and abstinence from substances	Money Total possible payment of \$1006	Higher rates of competitive employment and earlier transition to employment in incentive group Longer time to first positive drug screen in incentive group No significant differences in retention in CWT between groups	Yes at follow up (16 weeks after intervention)
Roll <i>et al.</i> 2004	Within subjects reversal design A-B-A	Day centre at a veterans medical centre USA	3 patients with schizophrenia	8 weeks (2-4-2)	To examine the feasibility of using voucher based reinforcement therapy (VBRT) to encourage abstinence from cocaine	Vouchers redeemable for goods at a small store in the VA medical centre \$3 given for negative samples, escalating by \$3 for consecutive cocaine-negative urine samples and a \$10 bonus for three consecutive negative samples	Increase in abstinence from cocaine in the intervention period, however this was only effective in the first two weeks	No follow up
Helmus <i>et al.</i> 2003	Within subjects reversal design A-B-A	Community Mental Health Centre Detroit, USA	20 patients with dual diagnosis (3 with schizophrenia, 6 with bipolar I, 7 with major depressive disorder and 4 with schizoaffective disorder)	20 weeks (4-12-4)	To evaluate the effectiveness of a contingency management program on group counselling attendance and abstinence from alcohol	Voucher for a local retail store \$2.50 for each attendance and/or negative breathalyzer reading Participant's earned on average \$31.5	Attendance was significantly higher in CM than the previous four week baseline period (t(19)=-3.59, p<.01) All breathalyzers were negative in the CM condition	Yes in the four week period after the intervention (t(19)=0.49, ns) No follow up

Table 1 – Studies of Interventions with Severely Mentally Ill Patients.

Source	Design	Setting	Sample size	Duration (in Aim weeks)	Type of incentive	Outcomes	Maintenance of outcomes
Messima <i>et al.</i> 2003	RCT	Narcotic treatment programme Los Angeles, USA	120 patients with anti-social personality disorder (ASPD)	16 weeks	To compare the efficacy of different approaches to the treatment of cocaine dependence Voucher \$2.50 per stimulant-negative sample, increasing by \$1.25 for each successive negative sample and a \$10 bonus for three consecutive negative samples Maximum possible earnings = \$1,277.50	CM conditions provided a significantly higher number of negative urine specimens than those in CBT only condition (CBT=24.8; CM=39.4; CBT and CM combined=37.7 vs. MM=9.3, $p<.05$)	Yes at follow up on weeks 17, 26 and 52 for CM conditions and CBT
Tidey <i>et al.</i> 2002	Within subjects reversal design	Local Outpatient Mental Health Centre USA	14 patients with schizophrenia	3 weeks	To examine the effects of contingency management on abstinence from smoking Money \$3 for first CO sample below cut off. Payment increased by \$0.50 for every consecutive sample below cut-off of CO levels <1 ppm Maximum payment for CM week was \$147.50	CO levels were significantly higher in the NC condition. (NC, C + PLA and C + NIC conditions were 28.0 (SEM=2.9), 20.5 (SEM=3.7), and 19.4 (SEM=2.9) ppm, respectively, $F(2,26)=4.86$, $p=.05$	No CO levels at two week follow-up were not significantly different to baseline levels
Sigmon <i>et al.</i> 2000	Within subjects reversal design	Local mental health clinic USA	18 patients with schizophrenia or serious mental illness	25 weeks	To assess the feasibility of using monetary incentives to promote abstinence from marijuana Money \$25, \$50 or \$100 given to participants for each negative urine sample	Number of marijuana-negative samples = same in three incentive conditions Number of marijuana-negative samples was significantly higher in all incentive conditions than at baseline	The number of marijuana-negative samples returned to the same levels as in the pre-incentive period
Roll <i>et al.</i> 1998	Within subjects reversal design	Local Mental Health Centre USA	10 patients with schizophrenia	3 weeks (1-1-1)	To assess the feasibility of using monetary incentives to promote abstinence from smoking Money \$3 for the first negative screen escalating by \$.50 for each consecutive sample below the cut off level	Number of positive CO specimens lower in intervention period than at baseline and post intervention ($q=3.5$, $p<.05$ and $q=3.7$, $p<.05$)	Not at post intervention period Not in follow up (8 weeks after participation)

Table 1 – Studies of Interventions with Severely Mentally Ill Patients.

Source	Design	Setting	Sample size	Duration (in Aim weeks)	Type of incentive	Outcomes	Maintenance of outcomes	
Shaner <i>et al.</i> 1997	Within subjects reversal design	Outpatient programme for mentally ill substance abusers USA	2 patients with schizophrenia	32 weeks	Money \$25 for each negative test	To assess whether contingency management (CM) could reduce cocaine use	Proportion of negative urine samples was lower in intervention period than pre and post intervention period Mean concentration of cocaine levels in positive samples was lower in intervention period than at baseline and not significantly different at post intervention phase	The mean concentration of cocaine levels in those samples that were positive were not significantly different at post intervention phase
Carey & Carey 1990	Time-series design	Mentally Ill Chemical Abusers (MICA) Day Treatment Program (Psychiatric Centre) USA	53 dually diagnosed patients: bipolar disorder (14), unipolar depression (13), schizophrenia (9), schizoaffective disorder (6), atypical psychosis (5), anxiety disorders (3), other (3)	12 weeks (4-4-4)	Vouchers \$3 redeemable at a local restaurant or bowling centre	To test whether offering an incentive would encourage attendance at a voluntary day treatment program	Participants met weekly criterion for attendance at day treatment significantly more often during intervention phase ((52)=2.47, p<.02), especially during last two weeks of the intervention	Post intervention phase attendance was modestly better than baseline attendance

Study Design

Nine studies utilised a time series study design with no control group. There was one case observation study (Claassen *et al.*, 2007) one controlled trial for active involvement in inpatient group meetings (Olson & Greenberg 1979) and three randomised controlled trials; two examining the effect of offering incentives to promote abstinence from substances (Messina *et al.*, 2003, Tracy *et al.*, 2007), and one for a combination of attendance at compensated work therapy and abstinence from substances (Drebbing *et al.*, 2005).

In three out of the ten studies aiming to reduce substance and alcohol misuse, the incentive was given for participation in therapy as well as for the provision of a drug negative sample. All studies were conducted in the United States with the exception of one UK based study (Claassen *et al.*, 2007), and were undertaken between 1972 and 2007. The intervention periods lasted between one week and 40 weeks with one study not specifying an end point (Claassen *et al.*, 2007), The sample sizes varied from between two and 120 patients, with nine of the studies containing a sample size of less than 30 participants.

Incentives used

The type of incentive used was either in the form of a direct payment of money or vouchers and in one study, money or vouchers alongside three bus passes a week (Olson & Greenberg, 1979). The maximum possible incentive that could be earned in each study ranged from \$12 to \$1,277.50. Where vouchers were offered, these could be exchanged for goods either in the shops of each centre, or on activities that were estimated to be valued by the participants, such as fast food, bowling and days out. Two studies used material goods as the incentive. Participants were given an extra allowance of tea, coffee or cigarettes or could win prizes from a lucky dip. An extra payment was given independent of the intervention in seven of the studies, usually after participants completed baseline assessments.

In the three studies focusing on psychiatric treatment, patients were offered £5-£15 per depot

injection received (Claassen *et al.*, 2007), \$10 per therapy appointment attended, usually one a week for a 12-week period (Post *et al.*, 2006), and a maximum of \$15 dollars a week for a 16 week period (Olson & Greenberg, 1979) dependent on attendance and participation in patient group meetings.

Outcomes

All of the studies found that the use of financial incentives can improve adherence to mental health treatment or abstinence from substances. The results show that during the intervention phase, when the incentive was offered, adherence to treatment and abstinence from substances improved when compared with baseline assessments, with eleven of the fourteen studies reporting this improvement as significant. Six out of the eleven studies that included a post intervention assessment demonstrated an improvement in adherence from the first baseline assessment; where measurements were recorded before the incentive was introduced, and the post intervention phase; where the incentive had been taken away and adherence was measured again. This improvement was only reported as significant in one of the studies. Messina *et al.*, 2003 demonstrated that abstinence from cocaine remained significantly higher at 52 week follow up (between 71% and 80% of cocaine samples provided were negative in the incentive conditions compared with 20% in the control group).

Claassen *et al.* (2007) reported that four out of five patients who were offered a financial incentive to adhere to depot medication accepted; three had improved adherence to medication after money was offered and were not re-hospitalised during the incentive phase. The fourth participant had improved adherence, however was re-hospitalised. Post *et al.* (2006) found that attendance at therapy sessions significantly increased from 79% in the pre incentive period, to 86% during the intervention phase, however this significantly decreased to 69% once the incentive payments were discontinued. Thyer *et al.* (1984) found that participants increased the amount of physical exercise they did during the intervention phase and that this was maintained 50 days after the incentive was withdrawn (no statistical analyses reported) while Olsen & Greenburg (1972) reported that the incentive group spent more days on leave from hospital than the control groups at 16 week follow up and had a significantly increased level of attendance at scheduled groups during the incentive period (no follow up).

DISCUSSION

The literature in this review suggests that offering financial or material incentives to people with a severe mental illness can improve adherence to treatment during the period of time in which the incentive is offered. Where follow up is documented however, five out of the eleven studies that carried out a post intervention assessment suggest that adherence deteriorates back to baseline levels or worse once the incentive is taken away. The remaining six studies maintained improved adherence, however only one study demonstrated significantly improved adherence levels when compared to baseline assessments (Messina *et al.*, 2003).

The strengths of this review are the systematic nature in which articles were extracted. We utilised a range of search methods and search terms including database and manual journal searches, as well as contacting experts to verify that no other published research on this topic existed.

The weaknesses of this review are the lack of homogeneity between studies, making it difficult to combine outcome measures and thus form a coherent conclusion applicable to a clearly defined population. Nevertheless we wanted to be as broad as possible in our search for articles specific to the severely mentally ill population due to a presumed lack of research in the field.

Financial incentives have been found to be successful in modifying a range of health behaviours (Jochelson, 2007), therefore the potential they may have in influencing adherence to treatment among people with mental health problems should not be underestimated. Research specific to mental health settings is however limited to a small number of studies, with most of the research aimed at improving adherence to substance misuse treatment programmes and the provision of drug negative samples.

There are also methodological problems with the majority of studies included in this review. There are very few randomised controlled trials on financial incentives in this population, and 10 of the studies included in this review lacked a control group. Small sample sizes may impact on the generalisability of results to a wider population. Many studies do not include a follow up period beyond a post intervention assessment immediately after the incentive has been withdrawn, meaning that only short term conclusions regarding effectiveness can be reached. Three of the studies do not report statistical analyses on the data; therefore the significance of these results cannot be reported.

The finding in five of the studies, that adherence levels decline once the incentive is taken away, raises a practical issue as to the length of time incentive schemes should be implemented in order to achieve long-term treatment compliance. This is not addressed by the existing research. A consideration of why patients may discontinue treatment once incentives are withdrawn is also absent from the research. Nose 2008 suggests that future research on medication adherence should take in to consideration the impact of side effects from both the patient and clinician perspective. What the existing research does suggest however is that even an offer of a small financial incentive has the potential to increase adherence to treatment during that time.

All but one of the studies were conducted in United States healthcare settings. The transferability of results to European models of healthcare needs to be treated with caution. For example, although the assertive outreach model appears to be effective in the United States, it was found to be no more effective than the care provided by community mental health teams in the UK (Burns *et al.*, 2007; Killaspy *et al.*, 2006). In the same way, financial incentives may not have the same impact when utilised outside of the United States insurance-based healthcare system.

Concerns have been raised around the acceptability of offering financial incentives to achieve mental health treatment adherence. Post *et al.* (2006) claim that it may be difficult to implement an incentive scheme at policy level because of differing opinions on whether patient payments are acceptable. The authors also reported that 52% of participants would attend therapy sessions for money even if they found the session unhelpful, which brings into question the impact that incentives may have on patient outcomes beyond simply turning up to treatment sessions. Olsen & Greenberg (1972) found that although attendance at group sessions increased with the introduction of incentives, patients in the incentive group demanded that the incentive program stop because they felt that their human rights were being deprived.

The results from this review suggest that financial incentives could be used as an effective tool for initiating engagement in mental health treatment and abstinence from substances. Further robust research is required to determine the long term effectiveness of financial incentives on improving adherence to treatment, as well as the impact incentives may have on patient outcomes, patient attitudes to treatment and the potential effect incentives may have on the therapeutic relationship between patient and clinician.

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