Nurse-led medicines monitoring: a study examining the effects of the West Wales Adverse Drug Reaction Profile


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Abstract

Aim The physical health of people with mental health conditions is often suboptimal, and in many cases this may be related to their prescription medicines. One issue is that patients are monitored inconsistently for adverse drug reactions (ADRs). The aim of this study was to explore whether the nurse-led West Wales Adverse Drug Reaction (WWADR) Profile for Mental Health Medicines could improve recognition and management of ADRs in a crisis resolution home treatment service.

Method The WWADR Profile was implemented in addition to usual care, in a one-group 'before and after' comparison study (n=20). The study took place from October to November 2013.

Results The WWADR Profile identified previously unreported physical health problems for all participants in the study, including two potentially life-threatening conditions: cardiac arrhythmia, chest pain plus breathlessness, and valproate-induced pancreatitis. In total, four participants’ medicines were discontinued, three were referred to a consultant psychiatrist, three were referred to GPs, one was referred to an electrocardiogram technician and one was referred to a dentist. Previously overlooked health promotion issues were also recognised.

Conclusion The WWADR Profile identified several physical health problems that had been overlooked previously. Therefore, it might be beneficial to use the WWADR Profile in routine mental health practice.

Keywords adverse drug reactions, drug monitoring, medicines management, medicines optimisation, mental health, West Wales Adverse Drug Reaction Profile

Previously, it was assumed that physical health monitoring of people with mental health conditions would be undertaken in primary care settings. However, guidance suggests that this would be better addressed by mental health specialists (Royal College of Psychiatrists 2009) and questions have been raised about whether mental health nurses are able to perform this role (Rylance et al 2012). Secondary mental health services have more frequent contact with patients than primary care services (Marder et al 2004) and should provide high-quality physical health care to their patients (DH 2011a, 2011b).
Adverse drug reactions (ADRs) (International Conference on Harmonisation (ICH) 1996) are responsible for 5-8% of unplanned hospital admissions in the UK (Pirmohamed et al 2004, National Institute for Health and Care Excellence (NICE) 2015), and the suboptimal reporting of common ADRs results in avoidable human and financial costs (Forster et al 2005, Gurwitz et al 2005). Nurse-led medicines monitoring is under-researched in healthcare, but has improved patient outcomes in acute mental health (Jordan 2002, Jordan et al 2002), care homes (Jordan et al 2014, 2015) and adult nursing (Gabe et al 2014).

**Aim**

The authors explored the clinical effect of formal, structured nurse-led medicines monitoring using the West Wales Adverse Drug Reaction (WWADR) Profile for mental health medicines (Jordan et al 1999, 2004, 2014, 2015) in a crisis resolution home treatment (CRHT) service in West Wales. The study aimed to explore:

- The number and nature of previously unrecorded health problems identified and addressed by the WWADR Profile.
- Changes to care as a result of the physical health problems identified by the WWADR Profile.
- Potentially serious ADRs identified by the WWADR Profile, as assessed by a consultant psychiatrist (CM).
- Interprofessional differences in recording physical health problems in initial assessments.

**Method**

**Study design**

This was a one-group ‘before and after’ comparison study, in which participants acted as their own controls. Individuals were observed before and after the intervention in an uncontrolled study (von Elm et al 2007, Reeves et al 2011). No formal sample size was calculated, as in pilot studies (Arain et al 2010). A total of 20 participants were assessed by a CRHT nurse or doctor using the assessment tools employed in the usual care provided by the CRHT service. These tools comprised standardised mental health assessments, using the health board’s electronic triage assessment tool (FACE) as a minimum. Participants were re-assessed 3 days later by an advanced nurse practitioner (RJ) using the WWADR Profile for mental health medicines. The physical health problems identified and addressed were compared.

**Setting and participants**

The CRHT service was established using non-medical staff, primarily nurses (Onyett et al 2008, Jones and Jordan 2010), and includes a consultant psychiatrist, middle-grade doctors and training-grade doctors. CRHT services provide an intensive mental health home-treatment service to individuals aged over 17 years who are experiencing severe and enduring mental illness, and are not currently admitted to hospital. This involves urgent assessment and treatment for patients presenting to mental health services, as well as working alongside community mental health teams (Welsh Assembly Government 2005a).

Participants’ inclusion criteria were: referred to the CRHT service between 14th October 2013 and 15th November 2013; received treatment from the CRHT service for 3 days or more; taking a prescribed antipsychotic, antidepressant or mood-stabilising medicine other than lithium; and being willing to give informed consent to responding to the WWADR Profile. Patients considered by the CRHT nurses or doctors to be too unwell or confused to participate were excluded from the study. Demographic details of participants and CRHT patients not referred to the advanced nurse practitioner to participate in the study were compared, to assess any selection bias and the extent to which the sample is representative.

**Intervention**

The WWADR Profile for mental health medicines is a formal system for nurse-led ADR and physical health surveillance. It aims to ensure physical health problems are recognised and addressed before they intensify or lead to patients not adhering

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**Conflict of interest**

The copyright and intellectual property associated with the West Wales Adverse Drug Reaction Profile belongs to Sue Jordan. Sue Jordan has no connections with commercial companies and the study received no commercial funding.

**Peer review**

This article has been subject to external double-blind peer review and checked for plagiarism using automated software.

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**Note:**

On 1st June 2012, the key functions and expertise for patient safety developed by the National Patient Safety Agency (NPSA) transferred to the NHS Commissioning Board Special Health Authority (www.england.nhs.uk/patientsafety)
Nurses in the CRHT service identified patients meeting the inclusion criteria and informed researchers. The ‘usual care’ assessment of these 20 patients, including all additional clinical entries between the initial electronic triage assessment and the time of the intervention, was reviewed. Physical health problems identified in the triage assessment and subsequent actions taken were recorded. After 3 days, the paper version of the WWADR Profile was administered by the advanced nurse practitioner, and physical health problems and actions to be taken were identified and recorded.

Results
A total of 20 of the 39 patients receiving usual care in the CRHT for ≥3 days were referred to the advanced nurse practitioner and approached to participate in the study. The authors were unaware that 19 patients had been inadvertently overlooked by CRHT nurses, and not referred to the advanced nurse practitioner, until the study

Data collection and analysis
Nurses in the CRHT service identified patients meeting the inclusion criteria and informed researchers. The ‘usual care’ assessment of these 20 patients, including all additional clinical entries between the initial electronic triage assessment and the time of the intervention, was reviewed. Physical health problems identified in the triage assessment and subsequent actions taken were recorded. After 3 days, the paper version of the WWADR Profile was administered by the advanced nurse practitioner, and physical health problems and actions to be taken were identified and recorded. Minimal demographic data, including age and sex of participants, were collected, but no patient identifiable data. Participants were asked about their medicines and records of their medicines were checked with the CRHT clinical notes.

The CRHT consultant psychiatrist (CM) assessed the clinical significance of the physical health problems identified and actions taken, and determined whether any ADRs fulfilled the criteria for ‘serious’; that is, potentially life-threatening or causing significant or persistent incapacity or disability (ICH 1996). Data were analysed using SPSS Version 20. Physical health problems identified and addressed with and without the use of the WWADR Profile, and changes in patients who had seen nurses and doctors, and those who had seen a nurse only, were compared with bivariate statistics.

Ethical considerations
Ethical approval for this study was granted by the Dyfed Powys Research Ethics Committee. All data files were password-protected and completely and irrevocably anonymised (Scott 2013). Non-intrusive clinical research, including retrospective review of patient notes, where there is neither inconvenience nor hazard to patients, does not usually require expressed consent (ICH 1996, Council of International Organizations of Medical Sciences 2002). The only questions asked were those that should be asked as part of routine care (DH 2000, 2001, Audit Commission 2001, National Audit Office 2005, Institute of Medicine 2007), and conferred no greater risk of harm (Council of International Organizations of Medical Sciences 2002). All of the questions asked related to potential ADRs and physical health problems, and were designed to ensure patient safety.
had closed. Those sampled were more likely to live in urban areas served by the CRHT. Age range and gender balance were similar in those sampled and not sampled. All 20 patients approached were willing to answer all sections of the WWADR Profile, with the exception of one participant, who declined to have vital signs measured.

The mean number of all medicines prescribed was 2.75 (standard deviation (SD) 1.5), range 1-6. A total of 12 participants were taking antipsychotics, 13 participants were taking antidepressants and 3 participants were taking mood stabilisers. Nine participants reported physical health problems, and for 7 participants these were identified for the first time. The primary diagnoses of participants were: affective disorder, including bipolar disorder (n=9); psychotic disorder (n=9), including 3 participants diagnosed with schizophrenia; other (n=2). While under the care of the CRHT service, 12 participants had been reviewed by nurses and doctors, and 8 participants had been reviewed by nurses only.

The WWADR Profile was completed in approximately 10 minutes for each participant. Two participants were not asked questions about health promotion because of urgent medical need. No alternative medicines monitoring instruments, such as the Liverpool University Neuroleptic Side Effect Rating Scale (Day et al 1995), were found in the participants’ clinical records.

**Physical health problems identified and addressed**

Some health problems had been checked during the electronic triage assessment, including self-harm or violence; mania; behaviour problems; restlessness; sleep; memory; concentration; energy; mood; hyperactivity; aggression; panic and hallucinations. Nevertheless, all participants had new potential health problems identified and addressed. The mean increase in health problems identified was 11.95 (SD 4.65), median 12, range 3-20. The mean increase in actions taken was 11.9 (SD 4.7), median 12, range 2-20.

**Physical health problems not recorded as part of usual care**

One participant had no physical health problems or actions recorded under usual care. A total of 52 potential physical health problems, including smoking, listed on the WWADR Profile had never been recorded as part of usual care (Box 1); 27 (52%) of these were linked to diet and health promotion. There were no records of blood pressure on standing, or heart rhythm, despite the

<table>
<thead>
<tr>
<th>BOX 1. Potential physical health problems not recorded for any participant under usual care</th>
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<tbody>
<tr>
<td>- Regular/irregular heart rhythm</td>
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<tr>
<td>- Blood pressure on standing</td>
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<tr>
<td>- Tongue tremor</td>
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<tr>
<td>- Feet shuffling</td>
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<td>- Abnormal gait on walking</td>
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<tr>
<td>- Bleeding/bruising</td>
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<tr>
<td>- Convulsions</td>
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<tr>
<td>- Headaches 1-2 hours after taking medicines</td>
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<tr>
<td>- Headaches</td>
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<tr>
<td>- Tinnitus/hearing problems</td>
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<tr>
<td>- Tingling/pins and needles</td>
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<tr>
<td>- Eyesight/dry eyes</td>
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<tr>
<td>- Urination difficulties</td>
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<tr>
<td>- Shortness of breath</td>
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<tr>
<td>- Chest pain</td>
</tr>
<tr>
<td>- Other (non-chest) pains</td>
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<tr>
<td>- Dry mouth</td>
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<tr>
<td>- Hypersalivation/respiratory tract infection</td>
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<tr>
<td>- Nausea/vomiting</td>
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<tr>
<td>- Indigestion</td>
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<tr>
<td>- Bowel control/diarrhoea</td>
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<tr>
<td>- Rash</td>
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<tr>
<td>- Itching rash</td>
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<tr>
<td>- Swelling/oedema</td>
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<tr>
<td>- Sore throat/liver</td>
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<tr>
<td>- Injection site pain or swelling</td>
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<tr>
<td>- Adequate diet (ascertained by 24-hour recall of intake at</td>
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<tr>
<td>breakfast, lunch/dinner, tea/dinner, supper)</td>
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<tr>
<td>- Snacking (risks of weight gain)</td>
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<tr>
<td>- Two or more meals eaten daily</td>
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<td>- Calcium intake adequate</td>
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<tr>
<td>- Vitamin D intake adequate</td>
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<tr>
<td>- Fruit eaten daily, fluid intake (ascertained as number of</td>
</tr>
<tr>
<td>cups of tea/coffee, number of soft drinks)</td>
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<tr>
<td>- Sugar free drinks used</td>
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<tr>
<td>- Problems with teeth or dentures/mouth care</td>
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<tr>
<td>- Halitosis, visits to dentists (6 and 12 monthly)</td>
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<tr>
<td>- Smoking, visits to opticians (6 and 12 monthly)</td>
</tr>
<tr>
<td>- Sunscreen available and applied correctly</td>
</tr>
<tr>
<td>- Hair loss</td>
</tr>
<tr>
<td>- Acne or herpes simplex reactivation</td>
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known risks associated with some mental health medicines (Taylor et al 2015, BNF 2016). Posture and movement ADRs, such as tongue tremor, feet shuffling and abnormal gait, were also not recorded.

Changes to care and clinical gains
A total of 16 participants made significant clinical gains, and 6 participants had prescription changes as a result of the use of the WWADR Profile (Table 1). Some of the main findings were:

» New prescriptions – the WWADR Profile resulted in new prescriptions for two participants (6 and 9), who were diagnosed with antidepressant discontinuation syndrome by the advanced nurse practitioner carrying out the WWADR Profile. Neither participant had been seen by CRHT doctors. Nurses who provided usual care for these participants noted that they appeared anxious, but no diagnosis had been made before the use of the WWADR Profile. A serotonin-noradrenaline reuptake inhibitor was re-prescribed for participant 9 and a benzodiazepine for participant 6 to alleviate symptoms of anxiety.

» Over-prescribing – some medicines were deemed unnecessary and discontinued for three participants. Participant 7 was prescribed two different antidepressants by a GP; one was stopped immediately, and the dose of the other was reduced. A hypnotic drug was also discontinued after reviewing participant 7’s caffeine intake, since their insomnia was attributed to drinking coffee late at night. Lifestyle advice on consuming caffeine late in the day and sleep hygiene was prompted by the WWADR Profile. An antipsychotic medicine was stopped for participant 11 since it was not considered necessary in the management of their symptoms. An antipsychotic medicine was discontinued for participant 2 as a result of a potentially serious rash.

» GP referrals (n=3) for further investigations – participant 17 had previously unrecorded but potentially serious cardiovascular problems, including cardiac arrhythmia, intermittent acute arrhythmia, and participant 12 was referred with an itching rash and participant 10 was referred to the GP with acute epigastric pain.

Serious adverse drug reactions
The consultant psychiatrist determined that two of the 20 cases fulfilled the criteria for serious ADRs (ICH 1996): cardiovascular problems in participant 17 and pancreatitis in participant 20 (Table 1). Participant 20 was monitored closely when tachycardia, elevated blood pressure, marked hand tremor, abnormal balance and movements, and shuffling gait were documented on the WWADR Profile. Further close monitoring identified abdominal pain. Following additional investigations, the participant was diagnosed with acute pancreatitis, which although uncommon, is a known ADR of sodium valproate (BNF 2016). Consequently, sodium valproate was discontinued for this patient.

The other significant ADRs identified using the WWADR Profile were rashes (participants 2 and 12) and epigastric pain and gastro-oesophageal reflux disease (participant 10). Taken with the two antidepressant discontinuation syndromes, a total of 7 of the 20 participants in the study had potentially serious ADRs identified for the first time. In addition, participant 13 was referred for an urgent electrocardiogram and participant 5 for a dental appointment following assessment using the WWADR Profile.

Interprofessional differences
The WWADR Profile identified more previously unidentified physical health problems and actions for those participants who had been reviewed by nurses only than for those who had been reviewed by nurses and doctors. Serious and potentially life-threatening physical health problems were not recognised by both professional
TABLE 1. Clinical gains for each participant (n=20)

<table>
<thead>
<tr>
<th>Participant</th>
<th>Clinical gains</th>
<th>Significant actions taken</th>
<th>Clinical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frequent headaches in the morning, easing through the day. Not previously noted.</td>
<td>Continue to monitor. Ruled out any serious organic cause.</td>
<td>Likely as a result of anxiety.</td>
</tr>
<tr>
<td>2*</td>
<td>Rash on abdomen noted. Not previously recognised. Timeline consistent with starting olanzapine.</td>
<td>Stopped olanzapine and monitor. Possible idiosyncratic (type B) adverse drug reaction (ADR).</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Short-term memory problems noted.</td>
<td>Continue to monitor.</td>
<td>Likely as a result of electroconvulsive therapy.</td>
</tr>
<tr>
<td>4*</td>
<td>Problems noted at injection site, not previously recorded.</td>
<td>Care coordinator informed and advised to monitor.</td>
<td>Compromises concordance.</td>
</tr>
<tr>
<td>5*</td>
<td>Patient had not seen a dentist for more than 10 years and had dental problems. Tongue tremor noted, possibly indicative of tardive dyskinesia.</td>
<td>Urgent dental appointment arranged. Note made of symptoms and advice to use atypical antipsychotic medicines only.</td>
<td>Potential for tardive dyskinesia.</td>
</tr>
<tr>
<td>6*</td>
<td>Diagnosis of antidepressant discontinuation syndrome. Alleviate unnecessary suffering.</td>
<td>Treatment with benzodiazepines as the patient is unable to tolerate any antidepressants.</td>
<td>Self-limiting within 2 weeks, but distressing and treatable.</td>
</tr>
<tr>
<td>7*</td>
<td>Identified over-prescribing and health promotion issues with diet that were significantly affecting on sleep. Stopped unnecessary medicines (antidepressant and hypnotic).</td>
<td>Lifestyle advice given and hypnotic medicine reduced then stopped. Unnecessary use of medicines and increased potential for ADRs.</td>
<td></td>
</tr>
<tr>
<td>8*</td>
<td>Tongue tremor identified.</td>
<td>Reported to the consultant psychiatrist. Continue to monitor.</td>
<td>Potential for tardive dyskinesia.</td>
</tr>
<tr>
<td>9*</td>
<td>Diagnosis of antidepressant discontinuation syndrome. Alleviate unnecessary suffering.</td>
<td>Treatment with serotonin-noradrenaline reuptake inhibitor immediately. Self-limiting within 2 weeks, but distressing and treatable.</td>
<td></td>
</tr>
<tr>
<td>10*</td>
<td>Identified likely gastro-oesophageal reflux disease.</td>
<td>Referred to the GP for further investigation. Rule out duodenal ulcer.</td>
<td></td>
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<tr>
<td>11*</td>
<td>Identified unnecessary dose of an antipsychotic medicine. Problems related to depression.</td>
<td>Antipsychotic medicine stopped. Unnecessary use of medicines and increased potential for ADRs.</td>
<td></td>
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<tr>
<td>12*</td>
<td>Itching rash identified.</td>
<td>Referred to the GP. Possible idiosyncratic (type B) ADR or possible vasculitis.</td>
<td></td>
</tr>
<tr>
<td>13*</td>
<td>Improved physical health recording of patient experiencing weight-gain from clozapine. Smoking history recorded.</td>
<td>Referred for urgent electrocardiogram for tachycardia. Managing high burden of metabolic side effects.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Suboptimal diet identified.</td>
<td>Lifestyle advice provided by nurses. None significant.</td>
<td></td>
</tr>
<tr>
<td>15*</td>
<td>Suboptimal diet identified. Smoking history recorded.</td>
<td>Lifestyle advice provided by nurses. Recording of significant health concern.</td>
<td></td>
</tr>
<tr>
<td>16*</td>
<td>Smoking history recorded.</td>
<td>None. Recording of significant health concern.</td>
<td></td>
</tr>
<tr>
<td>17*</td>
<td>Identified irregular pulse, intermittent radiating chest pain and shortness of breath. Smoking history recorded.</td>
<td>Referred urgently to the GP for further investigation. Potential for angina or more serious cardiovascular problems.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>No significant findings.</td>
<td>None. None significant.</td>
<td></td>
</tr>
<tr>
<td>19*</td>
<td>Abnormal movements noted.</td>
<td>Reported to prescriber and monitor. Potential for tardive dyskinesia.</td>
<td></td>
</tr>
<tr>
<td>20*</td>
<td>Deteriorating posture and movement recorded. Reported to the consultant psychiatrist. Further close monitoring revealed acute pancreatitis as an ADR to sodium valproate.</td>
<td>Sodium valproate stopped immediately. Acute pancreatitis.</td>
<td></td>
</tr>
</tbody>
</table>

*Denotes significant clinical gain
KEY POINT

In the WWADR Profile, targeted questions seek to identify problems that may be indicative of ADRs, and merit attention regardless of aetiology. For example, tachycardia may be symptomatic of muscarinic blockade induced by antipsychotic or antidepressant medicines; pancreatitis may be a result of sodium valproate or alcohol consumption; and dental problems may be secondary to bruxism (teeth-grinding), associated with the extrapyramidal side effects of some antipsychotic medicines (BNF 2016).

groups when the WWADR Profile was not used, including cardiovascular problems such as arrhythmia and pain on exertion, and valproate-induced pancreatitis.

Discussion

The WWADR Profile provided a structured approach to checking potential ADRs and physical health problems, regardless of the healthcare professional undertaking the initial review. All participants had previously unsuspected physical health problems addressed and 7/20 participants were found to have new significant or serious potential ADRs, including two life-threatening conditions (cardiac arrhythmia with pain on exertion, and acute pancreatitis), and two health problems requiring urgent attention (antidepressant discontinuation syndrome). Other new significant potential ADRs identified were: rash, itching rash, gastro-oesophageal reflux disease, and arrhythmia requiring an urgent electrocardiogram.

Strengths and limitations

The sample size of this study is small, reflecting the available resources, and indicating that findings should be interpreted with caution and regarded as preliminary.

This was a one-group ‘before and after’ comparison study, where participants acted as their own controls: the authors acknowledge the limitations of this design (Higgins and Green 2011), and the inherent biases in observational research (Tranter et al 2012). In adverse events research, evidence hierarchies are less applicable, and case series remain important (Higgins and Green 2011). In uncontrolled adverse event studies, signs and symptoms may have been related to underlying conditions, concurrent therapy, or spontaneous events (Talbot et al 2012); however, this does not detract from their importance or the practical adequacy of the research (Sayer 1992). Without a comparator group, the authors cannot be certain that changes were not, in part, attributable to the change in practitioner or changes over time; however, the time interval of 3 days means that changes over time are relatively unlikely.

Items on the WWADR Profile for mental health medicines were developed during educational effectiveness initiatives (Jordan et al 1999), based on the literature (Aronson 2015, Taylor et al 2015, BNF 2016). Patients and expert clinicians scrutinised these items for relevance, feasibility, accuracy (Jordan 2002), validity and reliability (Jordan et al 2004, 2014). In the WWADR Profile, targeted questions seek to identify problems that may be indicative of ADRs, and merit attention regardless of aetiology. For example, tachycardia may be symptomatic of muscarinic blockade induced by antipsychotic or antidepressant medicines; pancreatitis may be a result of sodium valproate or alcohol consumption; and dental problems may be secondary to bruxism (teeth-grinding), associated with the extrapyramidal side effects of some antipsychotic medicines (BNF 2016). The WWADR Profile includes health promotion advice that is particularly pertinent for people who take mental health medicines. For example, risks of glaucoma or cataract associated with some of these medicines increase the importance of regular visits to opticians for timely detection and management. Similarly, suboptimal oral care may exacerbate suboptimal oral hygiene as a result of xerostomia caused by antipsychotic and antidepressant medicines. It is not always possible to determine the cause of each physical health problem identified; however, for patients, relief of symptoms may be more important than aetiology, and identifying problems is a prerequisite to their management.

Data reliability depended on participants’ knowledge of their physical health, their cooperation, and their open and honest responses to questions. Purchased medicines and physical health problems may have been omitted where participants did not volunteer information; therefore, there was a risk of recall or social desirability response-bias. The authors consider the Hawthorne effect (Roethlisberger and Dickson 1939) unlikely, since the
WWADR Profile was used as part of the advanced nurse practitioner’s usual care schedule. To reduce the Rosenthal effect (Rosenthal and Jacobson 1966) and entrapment by prior expectation (Sackett et al 1991), all ADRs were reviewed by a consultant psychiatrist. No participants refused the intervention, reducing the potential for volunteer bias. However, the inadvertent incomplete referral of participants to the study by CRHT nurses suggests that the clinical importance of these findings is more important than statistical significance (Mitchell 1983), and does not detract from their practical adequacy (Sayer 1992).

From single-site research in a European Union convergence area (European Union 2008), it cannot be assumed that the participants in this study are representative of other populations, and rural services users were under-represented. Although participants were largely representative of the CRHT service, findings cannot necessarily be generalised to settings where the prevalence of the conditions under consideration may differ. However, the staff and patients of this CRHT service are representative of services elsewhere (Onyett et al 2008, Jones and Jordan 2010). To reduce observer variation, the WWADR Profile was administered by a single advanced nurse practitioner (RJ), who may differ from nurses undertaking routine care (Bork et al 2013). It is not known whether other professionals using the WWADR Profile would have made similar improvements to patient care; however, there are similarities in reports of nurses using the WWADR Profile in depot clinics (cardiac dysrhythmia, postural hypotension) (Jordan 2002, Jordan et al 2002), and care homes (mouth care, sedation, pain) (Jordan et al 2014, 2015). Although advanced nurse practitioners have more pharmacology training than most nurses, the majority of participants had previously been reviewed by medical practitioners, who had considerably more training. This indicates that differences in detection were attributable to the intervention, rather than healthcare professionals’ knowledge of pharmacology.

**Clinical gains**

A total of 6 of 20 participants had prescription changes following use of the WWADR Profile. The WWADR Profile provided a more focused, detailed and concise description of patient symptoms to the prescriber than the triage assessment. It resulted in appropriate treatment being offered sooner, relieving unnecessary symptoms, for example management of antidepressant discontinuation syndrome.

People with mental health conditions may be socially isolated, experience social inequalities, reduced healthcare and inadequate nutrition (DRC 2007). Their average life expectancy may be lower and the risk of cardiovascular disease increased compared with the general population. This is for several reasons, including: suboptimal self-care; adverse health behaviours, such as smoking or a sedentary lifestyle; and adverse effects of medicines (Brown et al 2010). These health problems persist despite regular contact with mental health services, and physical health monitoring remains inconsistent (Nash 2011). In this study, 27/52 (52%) of the previously unrecorded potential physical health problems were linked to diet and health promotion, and there was little evidence that health inequalities were being addressed as part of usual care.

Patients’ smoking history and changes in smoking were not recorded as part of usual care in the CRHT service. This failure to record a significant health concern is more serious where the elimination of prescribed medicines, for example clozapine, is affected by smoking. It is estimated smokers have 20-40% lower mean serum clozapine concentrations, affecting the efficacy of this medicine (Meyer 2001). Stopping or reducing smoking may result in sedation, hypersalivation, hypotension, akathisia, seizures or other neurological effects, and prolonged QTc interval (Taylor et al 2015).
KEY POINT
As nursing roles change, with increases in non-medical prescribers and unscheduled care, nurses’ responsibility and autonomy in relation to physical health care and ADRs will increase. Nurses may benefit from a systematic intervention that ensures they meet the standards and requirements of the professional regulatory body (Nursing and Midwifery Council 2006, 2007, 2015). The WWADR Profile may be one way of achieving this.

Overlooked adverse drug reactions
Effective pharmacotherapy necessitates reliable assessment of the benefits and adverse effects of medicines. Two thirds of ADRs may be preventable, and structured ADR profiles could be one way to achieve this (Gabe et al 2011). Psychiatrists’ consultations are usually informal, without detailed questioning, thus enabling ADRs to be overlooked (Quirk et al 2012). It is likely that the two cases of antidepressant discontinuation syndrome found in this study would have been identified during routine review with an experienced doctor; however, these are only scheduled where requested by the nursing team. It is unlikely that the cardiovascular problems identified in participant 17 would have been recognised without the WWADR Profile’s specified vital signs, delaying essential investigation and treatment of the cardiac arrhythmia, chest pain and breathing difficulties. Pancreatitis diagnosed in participant 20 was identified quickly as a result of closer monitoring after ADRs were identified using the WWADR Profile. This participant had been seen by a doctor 3 days earlier, suggesting that psychiatrists’ additional training had not prevented this condition from being overlooked. Some problems may have been discovered by the participants’ GPs during annual health checks, which have been introduced for people with mental health conditions. However, these checks are not always completed or sufficiently thorough (Gupta and Craig 2009, Vasudev and Martindale 2010); the WWADR Profile may compensate for these shortcomings.

Nursing roles and monitoring adverse drug reactions
The absence of a standard system for monitoring physical health and ADRs detracts from care (Caplan and Haverhals 2012, Morrison et al 2015); however, it is important to note that not all recorded ADRs are responded to appropriately (Bolton 2011). The ideal profile to identify ADRs would be simple and quick to complete, while capturing the important clinically relevant data, and improve clinical outcomes for physical and mental health conditions (Glasziou and Aronson 2008). Where instruments and questionnaires are brief, they may fail to collect useful information; whereas if they are lengthy they risk being considered a time burden. When optimising convenience and rigour of these tools, the needs of patients should be balanced with the constraints of services (Jordan et al 2004). The potential stress incurred by patients during monitoring should be considered. In community mental health teams, each section of the WWADR Profile could be completed incrementally over several appointments (Jordan 2002). However, the CRHT service is constrained by its short intervention period.

As nursing roles change, with increases in non-medical prescribers and unscheduled care, nurses’ responsibility and autonomy in relation to physical health care and ADRs will increase. Nurses may benefit from a systematic intervention that ensures they meet the standards and requirements of the professional regulatory body (Nursing and Midwifery Council 2006, 2007, 2015). The WWADR Profile may be one way of achieving this. However, the authors have identified several potential barriers to its adoption in clinical practice, including:

» Bureaucratic burden – when presenting all potential ADRs in one document, the WWADR Profile should not duplicate existing documents, thus adding to nurses’ workloads.

» Time – time spent completing the WWADR Profile should not detract from the nurses’ ability to provide care, and patients should not feel over-burdened by repeated or intrusive questioning.

» Structure – the use of a structured profile might compensate for practitioners’ deficits in knowledge or memory, but practitioners may be reluctant to acknowledge these.

» Knowledge – nurses may feel that they lack the required knowledge in relation to recognising and addressing ADRs, and therefore feel unprepared to monitor patients for medicines-related harm (Hemingway et al 2012).

» Communication – any problems...
identified require action, which often necessitates close liaison with a prescriber.

» Change – new roles for nurses may evoke anxiety, resistance and distrust if they are unforeseen or compulsory. Care should be taken to ensure any new intervention is clinically valid and worthwhile.

The future of adverse drug reaction monitoring

CRHT nurses undertake assessments 24 hours a day and have limited access to prescribers outside Monday to Friday between 9am and 5pm. Patients may be admitted to hospital and potentially remain unreviewed by psychiatrists for up to 72 hours. However, standards of care and treatment are expected to remain high (Welsh Assembly Government 2010). The absence of records of serious and common ADRs, such as posture and movement disorders, is of concern. NICE (2014) guidelines for schizophrenia state that clinical responses to medications and adverse effects should be monitored routinely. The WWADR Profile also improved monitoring of patients whose presentations, such as irritability or aggression, might otherwise lead to their signs and symptoms being overlooked.

For example, participant 20 often made physical health complaints, but it took the detailed monitoring of the WWADR Profile to recognise that he had pancreatitis. Secondary healthcare services are responsible for addressing all issues relevant to patients’ quality of life and well-being, and paper reminders might improve the process of care, particularly when they require responses from professionals (Arditi et al 2012). Standard 7 of the National Service Framework for Wales (Welsh Assembly Government 2005b) states that all patients should receive structured formal assessments and care that encourages engagement, anticipates or prevents crises, and reduces risks. Adopting the WWADR Profile might assist in identifying physical health problems or ADRs that may otherwise be overlooked.

Conclusion

This study emphasises the risks of overlooking ADRs in people who take mental health medicines; for example, ADR symptoms may be misattributed to illness. The clinical gains attributed to the use of the WWADR Profile suggest that its introduction into routine practice would be worthwhile, and discussions are underway at the national level. However, further research, including larger longitudinal studies and clinical trials, is necessary to guide future education and clinical practice.

IMPLICATIONS FOR PRACTICE

» Policy adoption of the WWADR Profile for mental health medicines should be requested at trust or health board level (Jordan et al 2016).

» The WWADR Profile should be incorporated into electronic record systems and monitored.

» The WWADR Profile could be included as part of best practice guidelines, audits and inspections.

» Leadership in nursing pharmacology should be fostered (Vaismoradi et al 2016).

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References


Council of International Organizations of Medical Sciences (2002) International


Talbot I, Keisu M, Stable L (2012) Clinical trials


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