



Metabolic monitoring of people with severe mental illness who are homeless: A successful quality improvement initiative

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Abstract

Aim: To inform service improvement by describing the process and impact of an initiative designed to enable metabolic monitoring among people with severe mental illness who are homeless and avoid services.

Method: A mixed methods observational study; analysis of quantitative and qualitative data from service documents, clinical records and interviews with service providers enabled a detailed account of the intervention and impact. To enhance transferability analysis was informed by a theoretical model of behaviour change.

Results: Provision of education, training, a portable monitoring kit and environmental restructuring was associated with substantial, sustained improvement in metabolic monitoring, with measures completed for ~90% of patients at six and 12 months post-implementation. Girth and/or BMI indicate risk of metabolic syndrome for most patients.

Clinical Implications: Given opportunity, capable clinicians motivated to improve patient outcomes, can integrate additional practices in routine care. Mobile metabolic monitoring is sensible, effective and acceptable to people who avoid services.

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Introduction

What is known about the topic?

Life expectancy of people with severe mental illness is curtailed by around 20%, with cardiovascular disease the leading cause of premature death. Acknowledging obligation and opportunity to attend to physical health of patients, mental health services internationally have been working to improve screening and management of cardiovascular risk. Substantial progress has been made but the various interventions described

have required attendance at clinics. Scant attention has been paid to improving care for people, such as those who are homeless who avoid services.

What does this paper add?

A description of an initiative that involved taking metabolic monitoring to the street implemented within a specialist 'homeless' mental health team. The approach developed by clinicians to address identified problems was feasible and acceptable to

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patients. The paper provides new information about the metabolic health of the population and application of a theoretical model to the design and effect of the intervention supports translation of findings to other settings.

What are the implications for practitioners?

A comprehensive understanding a challenge and engagement of those required to implement a practice is critical to sustainable improvement. Motivation and capability are important influences on performance of a (clinical) behaviour but opportunity is essential. Patients may be more receptive to interventions than anticipated when efforts are made to minimise practical and emotional burden.

Cardiovascular Disease (CVD) is the leading cause of excess mortality among people with severe mental illness [1,2]. While individual characteristics and health behaviours, particularly tobacco smoking, are implicated in genesis of CVD, medication used to treat mental illness and disparities in healthcare access, quality, and utilisation contribute substantially to poor outcome [2-5]. Mental health services, challenged by robust evidence that care has frequently fallen below acceptable standards [6,7], have been working to embed attention to physical health in routine practice [8-10]. With early detection and treatment critical to improving outcomes, efforts have focused on promoting adherence to clinical guidelines requiring regular metabolic monitoring (including assessment of BMI, girth, blood pressure, fasting blood sugar, triglycerides and lipids) of patients, particularly those on antipsychotic medication [2,3,7,10].

Changing clinical practice is notoriously difficult [11], but as evaluations of various interventions have shown, achievable. Introduction of specialist positions, scheduling monitoring at service rather than individual level, and formalisation of service policy and procedures have each supported improvement in rates of monitoring, identification, and follow up of cardiovascular risk factors among patients who attend clinics [7-9]. Evidence is limited, however, in relation to care for more marginalised populations, such as homeless people, who commonly avoid services.

While life circumstances, including sleep deprivation, stress and poor nutrition increase risk of CVD [12,13] and the need for health care, transience, mistrust, discrimination, and cost hinder access and therapeutic engagement [14-17]. These challenges necessitate innovative and well-targeted strategies to improve service delivery and health outcomes [18]. To inform design of these strategies, we critically reviewed a Quality Improvement (QI) initiative designed to enable Metabolic Monitoring (MM) for service users who are homeless.

Method

This observational mixed methods study was designed to comprehensively describe the process and outcomes of the initiative (hereafter QIMM).

Objectives were to describe

1. the design and implementation of QIMM
2. outcome (rates of monitoring and follow up of abnormalities) and mechanisms by which outcomes were achieved
3. the metabolic health of a group of people who are homeless and experience Severe Mental Illness (SMI)

To facilitate interpretation and translation of findings, the study was informed by a theoretical model of behaviour change: the COM-B system [19]. According to this model, Behaviour (B) (e.g. metabolic monitoring) is a product of dynamic interaction between physical and psychological Capabilities (C), reflective and automatic Motivations (M), and physical and social Opportunity (O) afforded by the context in which the behaviour is performed. While developed to support design of interventions related to patient behaviour, COM-B is applicable [20] and increasingly applied [21] to clinical practice.

The study protocol was assessed by the Chairperson of a National Health and Medical Research Council (NHMRC) certified Human Research Ethics Committee who considered it compliant with NHMRC guidance regarding "Ethical Considerations in Quality Assurance and Evaluation Activities" (2014) and thus, exempt from review (HREC16/QRBW/124)

Setting

QIMM was implemented within a Public Mental Health Service (PMHS) in an Australian State capital. PMHS provides specialist assessment and treatment to ~330,000 residents of a geographically defined catchment, encompassing an inner city area with multiple transport hubs and boarding houses. Around 2000 people sleep rough or are temporarily housed each night [20]. Consistent with international research, local studies demonstrate that the majority of these people have mental disorders of varying severity and many have complex physical and psychiatric co-morbidities [18,22,23]. Services for people with SMI who are homeless are provided by the specialised Homeless Health Outreach Service (HHOS). This multidisciplinary team, employs assertive outreach, with clinicians working primarily in public spaces and non-health care facilities (e.g. drop-in centres, food vans) accessed by the target population. Clinical and operational management are provided collaboratively by the team manager, (Author 3, an occupational therapist), a senior allied health clinician (Author 4, a social worker), a clinical nurse and a consultant psychiatrist (Author 6), who carries medico-legal responsibilities. Leaders meet monthly to review workload, establish service priorities and allocate resources.

PMHS has been working since 2011 to integrate physical health care in routine practice, requiring completion of metabolic monitoring for specified patient groups in two 'physical health months' annually [8]. Practice has improved such that around two thirds of patients eligible are screened each time, but remains variable within PMHS [8,10] with particularly low rates reported for HHOS (2012 to 2014).

Data collection

Mixed methods were used to collect and analyse data relevant to objectives. To enable description of the design, implementation and mechanisms of action of QIMM data were collected from service documents and in purposeful conversations [24] with HHOS leaders and clinicians. Three leaders (Authors 3,4,6) were interviewed by Author 2, an experienced qualitative researcher, on seven occasions over the course of QIMM and write-up. Initial conversations were exploratory, opening with an invitation to 'tell me what's happening with QIMM?' Subsequently, as findings developed, detail (for example, about responsibilities of allied health staff regarding assessment of blood pressure) was sought and views about mechanisms of action were explored. HHOS clinicians (n=16) participated in a single focus group facilitated by Authors 1 and 2 at a weekly clini-

cal team meeting (January 2015). Open questions and prompts were used to explore views about process and impact of QIMM: e.g. 'How was such a change achieved?'; 'What made it possible to improve metabolic monitoring?'. All conversations were manually recorded by the interviewers with records reviewed for accuracy by leaders. Outcomes were assessed using data from a retrospective audit of clinical records of service users eligible for screening at each of three time points: pre-initiative (T1; November 2013), post-initiative (T2; April 2014), and follow up (T3; November 2014). Extracted from charts by Authors 3 and 4 were basic demographics and notation regarding monitoring including completed measures and follow-up provided.

Data analysis

Data were analysed by Authors 1 and 2 using Microsoft Office and SPSSv21 (IBM Corp). Simple descriptive statistics were used to characterise patients, and determine rates of monitoring, abnormalities, and interventions provided. Chi square (χ^2) test with alpha $p < .05$ was used to assess differences in rates of monitoring at time points. Qualitative data were analysed using a simplified framework approach [25]. Data were charted as they were generated to a frame representing source by stage of the initiative (e.g. planning, implementation), proposed mechanism of action or impact. A process involving constant comparison, categorisation and diagramming was used to develop account of the data. Barriers and enablers to implementation and monitoring were identified and allocated to the COM-B model. Authors 3, 4 and 6 supported analysis and interpretation, drawing on their 'insider' experience to critically review findings for factual accuracy and resonance.

Results

Identifying and understanding the problem

QIMM was initiated when PMHS data demonstrated an absence of metabolic monitoring for HHOS patients in November 2013 (T1). HHOS leaders, motivated to both achieve PMHS key performance indicators and improve outcomes for patients, agreed that the 'current state' (recently achieved team stability following a service reconfiguration, achievement of routine KPIs, and clinical skill mix) would support practice improvement. They established the ambitious target of full adherence to policy during the forthcoming monitoring period (six months later) and beyond.

At the next clinical meeting, leaders jointly addressed the team and presented PMHS metabolic monitoring figures, noting that other teams were consistently achieving rates above 75%. They identified their target and, to encourage collective engagement, sought advice from clinicians about factors hindering or enabling monitoring for HHOS patients. Clinicians were 'aware' of PMHS policy requiring monitoring but considered this out of scope for HHOS and reported prioritising safety, and management of psychiatric and psychosocial crises. They reported limited knowledge about the reasons for monitoring, the extent of physical illness among people with SMI and the additional risks associated with homelessness. Potential barriers to incorporation of monitoring in practice identified were patient expectations regarding brief contact and clinicians being concerned with mental rather than physical health, and the specialist nature of some metabolic monitoring tasks (e.g., measuring and interpreting blood pressure, measuring girth and interpreting blood tests) making them out of scope of practice for allied health clinicians. A fundamental problem identi-

fied by clinicians was the location of monitoring equipment and phlebotomy clinics in health service facilities avoided by HHOS patients. However, clinicians also affirmed their commitment to improving patient outcomes and demonstrating that HHOS could achieve best practice (and out-perform other teams).

Consensus was that achievement of the target would depend on clarity about responsibilities for various assessments, development of clinical skills and confidence and on minimising the burden associated with screening for clinicians and patients. To maximise opportunity for success, a decision was made to 'take monitoring to the street' and, given anticipated patient resistance to blood collection, agreement was reached that monitoring would be considered 'complete' when clinicians had made what the team agreed were 'all reasonable measures' to obtain each assessment.

QIMM intervention

QIMM involved interlinked activities designed to build on identified enablers and address barriers, summarised in Table 1, to increase likelihood of MM.

Key components were:

A portable metabolic monitoring kit, including needed equipment (sphygmomanometer, glucometer, scales, tape measure).

Work unit procedures and supporting documents designed to standardise MM processes and recording. Central to guidelines was allocation of responsibility for various assessments; clinicians were required to complete assessments within scope of practice and to make arrangements with colleagues as needed for others (e.g. including a nurse in visits to patients needing blood tests). Medical staff was responsible for follow up of identified abnormalities and sign off. To prompt clinicians to complete assessments, administrative officers attached a Metabolic Monitoring Pack containing record form, pre-printed pathology test form, and a patient information sheet to medication charts of eligible patients.

Education and skill development session (attended by all clinicians): an hour-long workshop including didactic presentation of evidence regarding physical health of people with SMI, particularly CVD and increased vulnerability associated with homelessness, emphasising that early detection through metabolic monitoring and treatment were essential to improving outcomes. A five minute video demonstrating girth measurement was shown before clinicians rehearsed the MM process with peers. Discussion focused on generation of solutions to anticipated barriers – particularly patient engagement.

Enhanced phlebotomy access: clinicians were provided with written information regarding location and hours of pathology clinic location and encouraged to accompany patients to have blood taken wherever possible. Arrangements were also made with a local company to conduct weekly phlebotomy clinics at a homeless shelter.

Monitoring and feedback: An iterative improvement process was anticipated. Metabolic monitoring became a standing agenda item for daily clinical meetings, expectations were reinforced, progress was reviewed and celebrated, and the team 'problem solved' monitoring for particular patients or agreed to sign off. Learning from discussions was used to inform further activities.

At the completion of each routine screening cycle (T2 and

T3), team performance was reviewed collectively and HHOS clinicians were congratulated on achievements.

Outcomes

As shown in Table 2 QIMM was associated with substantial, sustained improvement in monitoring; any assessments were completed for nearly 90% of patients eligible at T2 (25/28) and T3 (33/38) and all assessments were completed for around half, each time. The 43 patients assessed (15 monitored T2 and T3), including 34 (79%) men were aged 20 to 54 ($M \sim 38$) years. All had diagnoses of a psychotic disorder and were prescribed anti-psychotic medications. Most commonly assessed was weight, recorded for all patients at both times. Any metabolic abnormality was identified for the majority of patients (T1: $n=18$, 72%; T2: $n=30$, 91%) with excess girth (≥ 102 cm men; ≥ 88 cm women) and BMI (>30) most commonly reported. Any abnormal blood result was observed in nearly half of patients tested. The only follow up interventions documented were referral to GP and counselling (discussion with clinician and psychoeducation), offered to most patients with identified blood abnormalities but inconsistently in relation to other abnormalities.

Mechanisms of action

Consensus was that the pre-existing collaborative culture, team case management model and pragmatic approach of highly motivated clinicians accustomed to 'going the extra mile' provided a solid foundation for improvement. While having portable equipment was essential to success of QIMM, it was not regarded as sufficient. HHOS leaders and clinicians attributed sustained change to united leadership and individual and collective commitment of team members to achieving a clearly articulated goal. Engagement of the team collectively in understanding 'the problem' (absence of MM) and developing solutions was considered critical. While acknowledging the satisfaction derived from outperforming 'mainstream' teams, clinicians were adamant: once they knew about risks and appreciated the potential for monitoring to improve health 'it was just part of the job'. Repeated prompts (at meetings, inclusion of MM documents in case notes and feedback of performance data) and regular solution focused feedback on performance were described as helpful in maintaining motivation.

Discussion

This observational study addressed a hitherto neglected area – metabolic monitoring among people with SMI who are homeless and do not attend mental health clinics, specifically examining the process and outcomes of an initiative designed to improve practice of a specialised team. While changing clinical practice is widely regarded as difficult, this study contributes to a growing body of evidence demonstrating that given opportunity, appropriately motivated, capable mental health clinicians can adopt and sustain new practices related to physical health of people with SMI. Moreover, consistent with studies demonstrating that people with SMI care about their health and expect services to be proactive [26,27], the study also demonstrates that people with SMI who are homeless are willing to complete, at least some, metabolic assessments. Demonstrating that the majority of patients were at increased risk of CVD, the study also contributes important information to a scant evidence base about metabolic health of this 'hidden' population.

The high prevalence of excess girth and/or BMI identified in HHOS patients is cause for grave concern, particularly with

similar findings in other contexts [14] indicating this is not a localised problem. While the limited completion of blood tests means we cannot reliably estimate prevalence of metabolic syndrome, we and others have found previously that patients with SMI who are abdominally obese commonly have at least one other metabolic abnormality, and around two thirds will have three or more, satisfying diagnostic criteria [10].

Implications of findings should be considered in light of limitations. Chief amongst these are conduct of the study within a given context, reliance on routinely collected data (that may contain inaccuracies) to assess performance and metabolic health. Moreover, the potential for self-serving bias [28] to have coloured the views of leaders and clinicians about the effect and the mechanisms of action of the interventions and various components must be considered; given the absence of any monitoring at baseline, improvement in performance was all but inevitable. While provision of portable MM equipment and enhanced access to phlebotomy may be regarded as the core of this intervention, sustained improvement was dependent on the motivation and capabilities of clinicians. We acknowledge that the clinicians involved in this study may be atypical in that they have self-selected to work with a highly vulnerable population, are accustomed to working in unconventional ways to deliver services and supported by team culture that is accepting of the associated risks. Indeed, with other PMHS teams consistently reporting MM rates of $\sim 75\%$ [8,10] it is likely there is something distinctive about the setting and clinicians involved. These limitations are balanced by application of a theoretical model to support 'intelligent generalisation'; [29] findings have implications for clinical practice and can usefully inform design of initiatives to improve the quality of services.

Reduction in cardiovascular related morbidity and mortality in this multiply disadvantaged population (as more generally) is dependent on action on two fronts. First, mental health services must develop locally relevant strategies to ensure that patients who are homeless are enabled to access the metabolic monitoring that is increasingly available to patient who attend clinics. Given accurate assessment of cardiovascular risk and diagnosis of diabetes is dependent on blood tests (and low uptake of these tests in this study), it is critical that services identify and address barriers to their conduct. With robust evidence indicating that health professionals commonly hold negative views about people who experience mental illness [5] and those who are homeless [30], consideration should be given to the attitudes of phlebotomists and others involved in enabling testing. Secondly, while monitoring is necessary it is not sufficient; improvement in health outcomes is dependent fundamentally on the effective delivery of interventions to treat identified abnormalities and promote health. Given limited reach, resources and the specialist nature of clinical skills, mental health services must work in partnership with other agencies to enable access to, preventative and primary health care and with social services to support uptake of health promoting behaviours. In saying this, we echo the views of many authoritative clinicians and researchers [6,31] who have identified collaboration within and across health and social care sectors as fundamental to addressing the health inequalities that persist in the wealthy west.

Noting the absence of the patients' voice in planning QIMM and this account, and relative silence in pertinent literature we consider investigation of the views and experiences of people with SMI who are homeless critical to development and evalu-

ation of interventions targeting improvement in their health. For optimal results, people who are homeless would be actively involved in design and conduct of investigations. As proposed by its originators, COM-B could provide a useful frame for understanding health related behaviour in this context and the associated Behaviour Change Wheel could inform intervention design.

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