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Abstract 250 words

Aim: The authors compare two approaches to assessment of the quality of early psychosis intervention services, the National Clinical Audit of Psychosis used in the United Kingdom and the First Episode Psychosis Services Fidelity Scale used in North America and Europe.
Methods: We compare the two approaches on the source of standards, measurement type, data collection, time requirements, resources used, scoring and reliability. Finally, we review their strengths and limitations.
Results: Both measures are based on standards derived from the same research evidence base. Both methods rely on data from health records and administrative data. The audit is supplemented with user survey data, the fidelity scale with clinician interviews. The audit appears to require less time. The audit is based on quality indicators rated as present or absent which yields a statistical benchmark. The Fidelity Scale is based on quality indicators that are rated on a five-point scale yielding a standards-based measure. The two methods cover similar core service components, but the FEPS-FS has a broader coverage of team functioning. The National audit also collects data on the user experience directly from patients. The fidelity scale has achieved good to excellent inter-rater reliability, the reliability of the audit has not been tested.
Conclusions: Both methods deliver reliable and useful measures of quality of care. The NCAP works in the context of a single provider health system, the FEPS-FS works in a more variable health system. Comparing the two systems in the field would support international comparison of standards of care.

2964-word count

Introduction

The clinical benefits of team-based first episode psychosis services have been conclusively demonstrated (Correll et al., 2018). A systematic review also found robust evidence to support the cost-effectiveness of team-based care, particularly in high income countries (Aceituno, Vera, Prina, & McCrone, 2019; Rosenheck et al., 2016). Implementation of early psychosis services outside of randomized controlled studies have also shown encouraging results (Christine Merrild Posselt , Nikolai Albert , Merete Nordentoft , & Carsten Hjorthøj 2021). Successful implementation of evidence-based practices requires the alignment of a complex set of processes, with identification and measurement of the core components at the heart of the process (Damschroder et al., 2009). The core components can be measured with a selected set of individual indicators or with a fidelity scale with a set of indicators specific to the evidence based practice (Hermann, Chan, Zazzali, & Lerner, 2006). Several fidelity scales have been developed to assess treatment for early psychosis intervention services (D. Addington, 2021a; D. Addington, V. Noel, M. Landers, & G. R. Bond, 2020; Essock et al., 2015; Hetrick et al., 2017; Melau, Albert, & Nordentoft, 2019). In the United Kingdom a set of individual core indicators has

been identified by the National Clinical Audit of Psychosis (NCAP) to assess delivery of care in early psychosis intervention services (Royal College of Psychiatrists, 2020).

The authors compare two measures not based on individual program models such as OPUS (Melau et al., 2019), EPPIC (Hetrick et al., 2018) or RAISE (Essock et al., 2015). We compare the National Clinical Audit of Psychosis (NCAP) which is used in the England and Wales National Health Services and from 2020, the Republic of Ireland (Royal College of Psychiatrists, 2020) to the First Episode Psychosis Services Fidelity Scale (FEPS-FS) which has been used in Canada, the United States of America and Italy (D. Addington, V. Noel, M. Landers, & G. Bond, 2020; D. Addington, C. C. Cheng, et al., 2020; Durbin et al., 2019). The details of these approaches to measurement have changed over time but in this paper, we refer to the 2020 versions of the measures.

Methods
We compared the two quality measurement systems on the source of their standards, measurement type, the data sources, time commitment of programs to assessment, scoring and reliability.

Results:

The National Clinical Audit of Psychosis (NCAP) is an annual audit carried out in all National Health Service funded Early Intervention in Psychosis teams in England, Wales, and the Republic of Ireland.

Source of Standards:
The NCAP standards are based on systematic reviews synthesized into the National Institute of Health Care and Excellence quality standards for treating and managing psychosis in adults and children (National Institute for Health and Care Excellence NICE, 2015a, 2015b). The National Institute for Health and Care Excellence (NICE) defines quality standards that set out the priority areas for quality improvement in health and social care. They cover areas where there is variation in care. Each standard includes both a set of statements to help improve quality and information on how to measure progress. Quality standards are developed independently in collaboration with health and social care professionals, practitioners, and service users. They are based on NICE guidance and other NICE-accredited sources. NICE indicators measure processes that reflect the quality of care, or processes linked, by evidence, to improved outcomes. The NCAP standards are based on the Early Intervention in Psychosis Access and Waiting Time Standards (National Institute for Health and Care Excellence, 2016).

Measurement Type:
The NCAP is a system of statistical benchmarks meaning that individual programs are compared with all other programs (Hermann, Chan, Provost, & Chiu, 2006). EIP teams are identified as an outlier for a standard if their performance is more than three standard deviations (SD) outside of the average performance of all EIP teams. Outlier standards are chosen and agreed with a

stakeholder Steering Group prior to data analysis and management of outliers follows guidance prepared by the Health Quality Improvement Partnership (HQIP).

Sources of Data

The NCAP has been commissioned by the Healthcare Quality Improvement Partnership (on behalf of NHS England and NHS Improvement) to conduct an annual audit of "Early Intervention in Psychosis (EIP) services' ability to provide timely access to NICE-approved packages of care" (National Institute for Health and Care Excellence, 2016). The audit is based on three sources of information, a health record audit, a contextual data questionnaire which collects administrative data and a service users survey.

The health record audit is based on a retrospective sample of 100 patients per EIP team who had been on the caseload for at least 6 months prior to the census date. Beginning in 2021, the sample will be weighted with a requirement to ensure that the sample includes EIP clients aged 14-18 years based on a percentage of expected cases aged 14-17yrs per EIP team. The report provides data on 9 key quality indicators, which are developed from quality standards see table 1. In addition, the NCAP team do 4 fidelity quality assurance visits of EIP teams picked at random including 1 EIP team in Wales. Fidelity in quality assurance visits is typically found to be high.

Each EIP team assessed also completes a Contextual Data Questionnaire which has 11 questions. The questions cover a range of practices from collection of demographic data to practitioner training, caseload sizes, age ranges served and service duration (Royal College of Psychiatrists, 2020). This questionnaire covers several administrative data elements such as staffing, and age ranges served. See table 2.

A third source of information is the NCAP service user survey which is a spotlight audit not carried out annually but carried out in 2019/20 and will be repeated in 2021/22. This survey is sent out independently to an EIP patient sample from all EIP teams. The 17 survey questions ask service users about their experience and receipt of interventions from an EIP service user perspective. See Table 3

Time commitment of programs to assessment:

The health record audit questionnaire is designed to be short and typically takes approximately 1 hour per patient record to complete, totalling about 100 hours for 100 records. The Contextual Data Questionnaire has 11 questions and takes about 1 hour to complete. The survey questions are sent out and analyzed by the auditors and are not a direct burden on the Early Psychosis Team.

Scoring:

The clinical service components are assessed by a set of quality indicators that are rated as present or absent (Hermann & Palmer, 2002). The ratings derived from 100 health records provides a percentage score for each indicator and gives an overall performance score at 4 levels: level 4, "Top performing"; level 3, "Performing well"; level 2, "Needs improvement" and level 1: "Greatest need for improvement". The results of the contextual data questionnaire and the

spotlight audit are used to provide for more individualized recommendations for quality improvement to individual programs.

Reliability: There is no data available on the reliability of the NCAP audit.

The First Episode Psychosis Services Fidelity Scale:

Source of Standards:
The FEPS-FS is a measure developed independently by researchers using knowledge synthesis strategies and a standardized methodology for developing fidelity scales (Bond, Evans, Salyers, Williams, & Kim, 2000; Tricco, Tetzlaff, & Moher, 2011). The first stage involved a systematic review of the clinical service components used in randomized controlled studies of early psychosis intervention services, second, the level of evidence for each component was rated, third a Delphi consensus process with international experts was used to identify the essential service components (D. E. Addington, Mckenzie, Norman, Wang, & Bond, 2013). Next the previously identified core service components were given definitions and concrete rating criteria were developed for each component. In addition components addressing team functioning were added based on both the first episode psychosis literature and a systematic review of team based mental health services (Wright, Catty, Watt, & Burns, 2004). This first version of the fidelity scale was tested on programs in the United States and Canada (D. E. Addington et al., 2016). The scale was then modified in response to feedback from two multisite studies, one in Canada and one in the United States, the former based on a representative sample of 9 sites, the latter on remote assessment of 36 programs from 32 States (D. Addington, V. Noel, et al., 2020; Durbin et al., 2019). The scale was applied with a self report method to assess the Italian Early Psychosis Services (D. Addington, C. C. Cheng, et al., 2020). The scale has also been used in the form of a check list with components rated as present or absent in order to assess service provision at a system level (Niendam et al., 2019). The fidelilty scale and manual are freely available through a creative commons license (D. Addington, 2021b). A recent review of the evidence base for both components and ratings has been published(D. Addington, 2021a).

Measurement Type:
The FEPS-FS is a standards based measure, meaning that an individual program is measured against a standard that is defined in advance (Hermann & Provost, 2003). The FEPS-FS 1.0 version has 35 components each rated on a 1 – 5 scale with a score of 4 or 80% being rated as satisfactory for each component or for the total scale score of 35 – 175 (D. Addington, 2021b). A standards-based approach makes it easier for an individual program to evaluate its performance. The standards are an implicit standard meaning that they have not been explicitly endorsed by any organization but have been developed from the literature using the knowledge synthesis strategies described above.

Sources of Data

Three sources of data are used to rate the FEPS-FS. These include administrative data, data abstracted from a random sample of health records and data derived from a structured interview with staff. The specific details are outlined the FEPS-FS 1.0 manual (D. Addington, 2021b). The manual specifies the sources of data that are usually the most reliable but leaves it up to the rater to work with the program to decide on the best source of data for the program. The scale is designed to collect data that is available in any health care system.

Time commitment of programs to assessment:
The time commitment to a FEPS-FS fidelity assessment was calculated by programs in the second year of a two-year remote fidelity assessment study in the US. The programs, which were collecting data for the second time, estimated that in the second year they needed about 12 hours to gather the necessary data and make staff available for interviews (D. Addington, V. Noel, et al., 2020).

Scoring:
The FEPS-FS 1.0 has 35 components each rated on a 1 – 5 scale with a score of 4 or 80% being rated as satisfactory for each component or for the total scale score of 35 – 175 with an overall score of 80% or 140 being considered satisfactory (D. Addington, 2021b). This allows for an individual program to compare their fidelity to the implicit standards of the scale or to published results. It also allows health systems to identify strengths or weaknesses across the system (D. Addington, C. C. Cheng, et al., 2020; D. Addington, V. Noel, et al., 2020; Durbin et al., 2019; Niendam et al., 2019)

Reliability:
Interrater reliability of the FEPS-FS has been assessed in two studies, first in the original pilot study using site visits and later, after modifications in a study using remote fidelity assessment with trained raters. Results in the remote assessment study were in the range of good to excellent (D. Addington, V. Noel, et al., 2020; D. E. Addington et al., 2016).

Comparison between measures:
There is significant overlap in the coverage provided by the NCAP audit and the FEPS-FS. There are 9 items in the NCAP standards and 35 in the FEPS-FS 1.0. The FEPS-FS covers 7 of 9 NCAP items, although not in every detail. The only NCAP item not addressed in the FEPS-FS is the use of routine outcome measures. The NCAP distinguishes between Family Education and Support and Family Interventions. The former only refers to education and support, whereas, Family Interventions refers to Behavioural Family Therapy (Pharoah, Mari, Rathbone, & Wong, 2010). The FEPS-FS uses the term family education and support, although the service delivered is broader than information and support, for example “Combines informational, cognitive, behavioral, problem-solving, emotional, coping, and consultation therapeutic elements (Lucksted, McFarlane, Downing, & Dixon, 2012) and the RAISE module on Family Education and Support described as the Modified Intensive Skills Training (MIST) a variant of Behavioral Family Therapy (Glynn et al., 2014).

There are also differences in the specification of the quality and quantity of the service provision. For example, NCAP indicator S2 “Service users with first episode psychosis services take up cognitive behavioural therapy” requires that a patient has a minimum of one session of Cognitive Behavioural Therapy for Psychosis (CBTp). In contrast, the FEPS-FS 1.0 requires that a patient receives at least 10 sessions of CBT delivered by an appropriately trained clinician. In order to score a 5, more than 80% of patients need to have at least 10 sessions. This is based on evidence that a minimum number of sessions is necessary for CBT to be effective (Lincoln, Jung, Wiesjahn, & Schlier, 2016).

The Contextual Questionnaire question Q5 is a multi-part question that covers a range of service models for service delivery. The NCAP audit distinguishes between two kinds of family services, Family Therapy, referring to Behavioural Family Therapy and carer focused education and support programs. The FEPS-FS mentions only Family Education and support, but a review of the contents of services delivered in family education and support shows overlap between education and intervention (Lucksted et al., 2012; Mueser et al., 2019).

There are 14 Items in the First Episode Psychosis Services Fideltiy scale that are not covered by either the NCAP audit or the contextual data questionnaire. See Table 4. Items not covered include the proportion of incident cases in the population served by the program and the proportion hospitalized prior to service entry. In addition, there are team based components describing team meetings and the range of services provided by the team. Also not covered are specific details on pharmacotherapy, services for those with addictions, outreach services and crisis services. Finally, measures of retention and linkages with inpatient care are not covered.

There are also significant differences in the way that implementation of services are measured. In the NCAP audit, services are either delivered or not delivered. In the FEPS-FS, services need to be provided by a trained clinician and the service delivery is scored on a 1-5 scale depending on the quantity of service delivered and the proportion of patients receiving the service. This is known as service penetration. For example, the number of sessions delivered to patients is requred to rate three components, cognitive behavioural therapy, patient psychoeducation and family education and support.

The FEPS-FS explicitly measures the proportion of the incidence cases in the population engaged in the program in comparison to the expected incidence. If there is no reliable data for the local incidence, a generic incidence rate derived from sytematic review can be used (McGrath, Saha, Chant, & Welham, 2008). If there is reliable data on the local incidence, the degree to which the program serves new incidence cases can be based on local data such as that which is available in the UK (Kirkbride et al., 2013).

The FEPS-FS has one component that adressess the use of fidelity measures or quality indicators to assess service quality. This component is a useful addition to the FEPS-FS which is used in multiple health systems but less relevant in the the NCAP audit which, by definition, is a required audit system for the whole health service in which it has been implemented.

Discussion

The FEPS-FS 1.0 and the NCAP EIP audit cover a similar set of core services, apart from those for substance use disorders. The NCAP audit provides a more parsimonious set of process indicators that can be repeatedly measured on a large scale and depends on an administrative and service user surveys to add depth to its evaluation. At a system level, it depends on a centralized governance and health care management system. The FEPS-FS 1.0 uses a more detailed set of performance measures that has been used in multiple health systems that are managed in different ways. It has not been repeatedly used in the same services except in an ongoing implementation study (Kozloff et al., 2020). It has been designed to compare programs that are organized and delivered in varied systems such as exist in many countries and health systems. It can identify strengths and weaknesses of individual programs and health systems (D. Addington, V. Noel, et al., 2020). In addition, the FEPS-FS 1.0 can be adjusted to assess the fidelity of three separate groups, those with a specific schizophrenia spectrum disorder, those with a bipolar disorder and those at clinical high risk of psychosis, also known as those with an attenuated psychosis syndrome.

Future research should include comparisons with the content of other widely used fidelity measures such as the Early Psychosis Prevention and Intervention Centre Model Integrity Tool and the Danish Specialized Early Intervention Fidelity Scale (Melau, Albert, & Nordentoft, 2018; Williams et al., 2021). The FEPS-FS 1.0 could be compared with the the results of the NCAP audit in a sample of English EIP programs. A selected sample of programs showing high, medium and low fidelity on the NCAP audit could be compared to test the hypotheses that the methods achieve the same results. More specifically, the programs would maintain the same rank order, the scores on the 13 shared items would achieve the same percentage score and the total percentage score would be the same, assuming that assessments covered the same time frame.

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Table 1 Comparison of NCAP audit items and FEPS-FS components.

NCAP items		FEPS-FS components
S1. Service users with first episode of psychosis start treatment in early intervention in psychosis services within two weeks of referral		14. Timely contacts. First appointment within two weeks
S2 Service users with first episode psychosis take up Cognitive Behavioural Therapy		24. Cognitive Behavioural Therapy. Patient receives at least 10 sessions of CBT
S3. Service users with first episode psychosis and their families take up Family Interventions. Uptake means at least one session of a family intervention.		Not covered as family therapy, but there is overlap with item 23. Family Education and Support.
S4. Service users with first episode psychosis who have not responded adequately to or not tolerated treatment with at least two antipsychotic drugs are offered clozapine.		21. Clozapine for medication-resistant symptoms
S5. Service users with first episode psychosis take up supported employment and education programmes		28. Supported Employment. SE provided to patients interested in participating in competitive employment 29. Supported Education. SEd provided to patients interested in participating in education
S6.	Service Users receive a physical health review annually. This includes the following measures:	
	i. BMI;	25.2 Supporting Health Item monitor weight
	ii. blood pressure	Not mentioned
	iii. use of tobacco;	25.6 Supporting Health Item monitoring smoking
	iv. use of alcohol;	27.1 Services for patients with substance use disorder
	v. substance misuse;	27.1 Services for patients with substance use disorder
	vi. measure of glucose control;	25.5 Supporting Health Item monitor glucose/ Hb A1c
	vii. lipids;	25.5 Supporting Health Item monitor triglycerides
	viii. history of cardiovascular disease, diabetes, hypertension or hyperlipoidaemia in members of the service user's family.	Not addressed

S7.	When monitoring within the past 12 months has indicated a need for intervention, the following have been offered to the service user or the treating clinician has made a referral for the service user to receive:	25. Supporting Health
	i. advice about diet and exercise	25.3 Supporting Health Item advice about diet and exercise
	ii. treatment for hypertension	25.1Supporting Health Item refer and enroll in primary care
	iii. treatment for diabetes	25.1 Supporting Health Item refer and enroll in primary care
	iv. treatment for dyslipidaemia	25.1 Supporting Health Item refer and enroll in primary care
	v. help with smoking cessation;	25.7Supporting Health Item pharmacological supports for smoking cessation
	vi. help with reducing alcohol consumption	27.2-4 Services for patients with substance use disorder
	vii. help with reducing substance misuse	27.2-4 Services for patients with substance use disorder
S8.	Carers take up or are referred to carer-focused education and support programmes	23. Family Education and Support. Family receives at least 8 sessions of family education and support in their first year
I 1.	Clinical outcome measurement data for service users (two or more outcome measures from HoNOS/HONOSCA, DIALOG, QPR is recorded at least twice (assessment and one other care point.	Not addressed

Table 2 Comparison of Contextual data questionnnaire and FEPS FS Components

Questionnaire Number	Question	FEPS-FS component
Q1	Demographic data collection	Not addressed
Q2	Strategies to identify and address inequalities in access, experience and outcomes	Not addressed
Q3	Age Ranges receiving services including service models	Item 10 Age range served
Q4	Length of treatment provided	Item 11. Duration of FEP program
Q 5	Services provided for children and young people including service models	Item 10 Age range served. Item Q5 d.e. address FEPS-FS Item 3. Services Delivered by team, but only for those under 18.
Q6	Number of full time equivalent EIP coordinator for the service	Item 2. Patient to Provider Ratio. Combines Q6 and Q 9
Q7	Increase in number of staff posts in last year?	Not addressed
Q8	Ability to provide Cognitive Behavioural Therapy for At-Risk Mental State	Item 6 Explicit Diagnostic Criteria identifies if the service serves the clinical high risk group Item 24 Cognitive Behavioural Therapy
Q9	Team Caseload	Item 2. Patient to Provider Ratio. Combines Q6 and Q 9
Q10	Numbers of people on case load in different age ranges	Not addressed
Q 11	Length of treatment in months of last 10 service users who completed care and discharge	Item 31.Patient retention.

Table 3 Comparison of Service Users Questionnaire and FEPS FS Components

Questionnaire Number	Question	FEPS-FS 1.0 components
Q1	Time in programs	Not addressed
Q2	Overall improvement or worsening	Not addressed
Q3	Discussion between provider and services user of exacerbating factors	22. Psychoeducation
Q4	Perception of being heard	Not addressed
Q 5	Discussion between provider and services user of ameliorationg factors	22. Patient Psychoeducation
Q6	Degree to which service user would recommend service to family or friends	Not addressed
Q7	Name of and ability to contact key provider	4. Assigned Case Manager / Care coordinator
Q8	Presence of care plan	18. Treatment / Care Plan
Q9	Family and friend involvement in services	15 Family involved in assessment 23. Family Psychoeducation
Q10	Presence and awareness of crisis plan	32. Crisis inrtervention services
Q 11	Antipsychotic prescription and shared decision making	19. Antipsychotic medication prescription
Q 12	Cognitive Behavioural Therapy	24. Cogntive Behavioural Therapy
Q 13	Family Intervention	23. Family Psychoeducation
Q 14	Smoking and smoking cessation	15. Supporting Health
Q 15	Physical health	15. Supporting Health
Q 16	Employment and employment support	28. Supported Employment
Q 17	Support for accessing housing or benefits	17. Psychosocial needs assessed
Q 18	Demographic data	Not addressed

Table 4. FEPS-FS items not covered by NCAP Audit, contextual questionnaire or service user questionnaire

Item Number	FEPS-FS 1.0 Item description
1.	Practicing Team Leader: Team leader has administrative and supervisory responsibilities, and also provides direct clinical services. Administrative and supervisory roles may be divided between two people
5.	Psychiatrist Caseload: Each patient has an assigned psychiatrist who has a caseload that allows for patients to be seen for medication reviews or other clinical indications
6	Psychiatrist Role on Team: Psychiatrists are team members who: 1. Attend team meetings; 2. See patients with other clinicians; 3. Are accessible for consultation by team during the work week; and, 4. Share health record with other team members
7.	Weekly Multidisciplinary Team Meeting: Team members attend weekly meetings that focus on: 1. Case review (admissions and caseloads); 2. Assessment and treatment planning; 3. Discussion of complex cases; 4. Termination of services.
9.	Population served and the proportion of expected incidence cases recruited to program
12	Targeted Education to health / social service / community groups about the service
13	Early Intervention. The proportion of people hospitalized prior to entering the first episode psychosis service
20.	Antipsychotic Dosing Within Recommendations For Individuals With Psychosis Antipsychotic dosing is within government-approved guidelines for second-generation antipsychotic medications, and between 300 and 600 chlorpromazine equivalents for first-generation antipsychotics 6 months after starting FEPS.
26.	Annual Formal Comprehensive Assessment Includes documented assessment of: 1. Educational involvement; 2. Occupational functioning; 3. Social functioning; 4. Symptoms; 5. Psychosocial needs; 6. Risk assessment of harm to self or others; 7. Substance use
27.	Services for Patients with Substance Use Disorders

	FEP program offers the following: 1. Routine assessment of substance use for all patients at intake and at review; 2. Substance use addressed in patient psychoeducation; 3. Substance use addressed in family psychoeducation; 4. Brief evidence-based psychotherapies including motivational enhancement or CBT for patients with substance use problems; 5. Continuity of care and patient engagement for patients referred to specialized substance use services ranging from detox to residential treatment.
30.	Active Engagement and Retention Use of proactive outreach by a designated team member, including community visits to engage individuals with FEP and reduce missed appointments
33	Communication Between FEP and Inpatient Services Upon hospitalization of FEPS patient, FEPS staff: 1. Contact inpatient unit to establish communication plan; 2. Visit with patient on inpatient unit; 3. Communicate with family about admission; 4. Are involved in discharge planning process; 5. Receive / obtain a hospital discharge summary; 6. Schedule an outpatient appointment prior to discharge
34	Timely Contact After Discharge From Hospital Patient in FEP service has face-to-face contact with FEP service provider within two weeks of discharge from hospital.
35	Assuring Fidelity: Program monitors quality using a published fidelity scale or quality indicators linked to standards for program treatment components calculated from health record audit or administrative data