



Implementing Patient Reported Outcome Measures in a Student-Faculty Clinic

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Abstract

Prenatal care for the underserved is a national concern, especially among homeless women likely to experience barriers to care during pregnancy. Inadequate prenatal care confers increased risk for gestational complications and unfavorable postnatal outcomes, including prematurity and low birth weight. Yet while many studies delineate the prevalence and health consequences of inconsistent prenatal care in the homeless and underserved, few explore the women's experiences or identify perceived needs within this population.

This study explored both positive and negative experiences with prenatal care and pregnancy among Philadelphia's pregnant homeless women with the intention of designing effective interventions to increase the consistency and to improve the quality of care. Study participants were recruited from Philadelphia's primary intake shelter for women and children, and were individually interviewed about their pregnancies and prenatal care experiences. Interviews were digitally recorded, transcribed, and reviewed for thematic elements. Nine women were interviewed in total.

Self-identified barriers undermining consistent prenatal care included issues with insurance, lack of transportation to appointments, and negative experiences with prenatal care during previous pregnancies. While some women reported rewarding relationships with their prenatal care providers, many expressed a need for education regarding exercise, diet, and stress-reducing practices for both expecting and breastfeeding mothers. Women also expressed interest in support groups, parenting classes, and therapy sessions as venues to share their stories and to learn from others. These insights inspired several initiatives at Eliza Shirley House for Women through JeffHOPE, Jefferson's medical student-run free clinic, including designing educational materials and classes, and providing family therapy sessions.

Introduction

Healthcare Quality and Patient Reported Outcome Measures

As healthcare providers—whether a physician, nurse, or medical student—we aspire to improve the health of our patients. Subjectively, health is an easy concept

to understand. But, defining what exactly constitutes a healthy outcome remains contentious. Indeed, many putative measures of healthcare quality are currently employed in the United States. Process measures—such as the proportion of patients receiving antibiotics after an operation—are easily collected but capture only the degree to which recommended services are

provided. Outcome measures—like adverse events or mortality—are important, but are harder to assess and may be too broad to provide meaningful value.

Patient reported outcome measures (PROMs) potentially represent a better gauge of quality. PROMs measure what matter most to patients—their own perceptions of health, quality of life, and functional status. They are collected directly from individuals and require no input or analysis by healthcare providers¹. By focusing on the experience of care, PROMs can complement other process and outcome measures, enabling a more holistic understanding of healthcare quality.

Initially developed as a research aid in the 1970’s, PROMs have been gaining popularity worldwide. In 2009, the National Health Service of the United Kingdom mandated the use of PROMs to compare outcomes in a small number of elective surgical procedures¹. More recently, in the United States, the National Institutes of Health and the Patient Centered Outcomes Research Institute (PCORI) have fostered the development of clinically significant

PROMs². As the use of PROMs has proliferated, many studies have demonstrated their widespread validity and utility³.

By quantifying an individual’s perspectives of care, PROMs also offer the potential to dramatically improve medical education. However, awareness of PROMs among medical trainees is limited, and their use in student-run clinics has not been reported.

Crimson Care Collaborative

The Crimson Care Collaborative (CCC) was founded in 2009 by the John D. Stoeckle Center for Primary Care Innovation at Massachusetts General Hospital (MGH) with the goal of educating students and fostering interest in primary care⁴. Since that time, CCC has expanded to 6 locations across the greater Boston Area. Each CCC clinic is integrated into existing primary care facilities and provides a largely underserved patient population with evening access to primary- and urgent-care services.

At CCC, faculty physicians affiliated with Harvard Medical School (HMS) supervise the

Validated Questionnaires	Area of Concern	Number of Questions
PROMIS-10 (Patient Reported Outcomes Measurement Information System – 10)	General Health	10
PHQ-2 / PHQ-9 (Patient Health Questionnaire – 2 or 9)	Mental Health	2, reflexes to 9 with initial positive response
AUDIT-C (Alcohol Use Disorders Identification Test Consumption)	Alcohol Abuse Risk	3
GAD-2 / GAD-7 Generalized Anxiety Disorder Assessment – 2 or 7)	Anxiety Risk	2, reflexes to 7 with initial positive response
IPV (Intimate Partner Violence Module)	Intimate Partner Violence	1
Falls Module	Fall Risk	2

Table 1. Patient Reported Outcome Measures Selected for Crimson Care Collaborative

education of a team of student clinicians—including medical, nurse-practitioner, pharmacy, and undergraduate students. Along with one-on-one clinical instruction, students learn through regular didactic sessions, collaborative research projects, and the inter-professional perspectives of their colleagues.

Project Goal

Given the large turnover of student clinicians at each CCC site, there is rarely continuity in the student-patient relationship, and it is difficult for students to track how patients have been responding to care. As such, we sought to implement a system that could track patient outcomes in an easily-reportable, real-time manner. By better understanding the range of patient outcomes achieved at CCC, we believe that future students will be able to generate well-informed ideas to improve quality.

Implementing Patient Reported Outcome Measures

Defining Needs and Requirements

We conducted an extensive literature review on PROMs implementation, through which we defined several project requirements. Regarding the administration and reporting of PROMs, several reports suggested that electronic data collection and reporting was crucial⁵. In order to fit into an already busy clinical setting, PROMs must be integrated with standard practices, collected with minimal provider intervention, and provide clinically relevant information.

Maintaining a high rate of patient responsiveness to PROMs is also important, and thus questionnaires should be administered quickly and conveniently, and patients should see that their answers are being discussed during each appointment⁵. Given CCC’s largely underserved patient population and reliance on student clinicians, we also required a system that would be easy-to-use with minimal

training. Additionally, since a large number of students rotate through each clinic, we hoped to develop a PROMs system that could track patients over time and communicate health changes to new providers.

Finally, questionnaires should elicit clinically relevant information in an easy-to-understand and validated format. Organizations such as Patient-Reported Outcomes Measurement Information System (PROMIS) and several specialty societies offer a broad array of free and validated PROMs surveys. It was important for us to determine the types of patients that we were most likely to encounter, and tailor PROMs to them. A majority of patients served by CCC are immigrants who rely on the clinic for their primary care. We thus sought questionnaires that would address their most common concerns while being easily translated into several languages. After several rounds of discussion with physicians, nurses, and patients, we arrived at the list of validated questionnaires (Table 1)⁶⁻⁸.

Partnering for IT development

Having required that our PROMs questionnaire be delivered electronically, we sought partners within HMS and MGH who could assist with technology development. Working together, we identified several technology vendors that sold HIPAA-compliant clinical data collection interfaces. After determining our unique specifications, we decided to use Tonic



Figure 1: Examples of the PROMs interface

(Tonic Health; Menlo Park, CA) for our data collection and reporting (Figure 1). Additionally, we were able to secure a small grant from the HMS Center for Primary Care to purchase six iPad tablets (Apple; Cupertino, CA) which were used as the electronic platform to deliver the survey to the CCC patients. As soon as all of the components were collected, we worked with our colleagues at MGH to translate our selected questionnaires into English, Spanish, and Chinese, and program them into Tonic.

Mapping Clinical Work Flow

Aiming to make the administration of our PROMs questionnaires as easy as possible, we laid out 2 ambitious goals; first, that we would not add any extra time to a patient’s visit, and second, that we would actually reduce the operational complexity of the clinic. In order to meet these goals, we first needed to understand the current flow of patients and information during each clinical visit. As shown in Figure 2, prior to the introduction of PROMs, the flow of information was complex. To minimize the need for extra time, we identified several periods in which patients sat idle during their visit. We decided to provide patients with PROMs questionnaires in the waiting room before each visit. We then designed a future informational flow diagram that optimized the use of electronically-captured patient data (Figure 3).

Pilot Phase

Armed with tablet computers loaded with PROMs questionnaires, we began the implementation with a pilot. In this phase, a dedicated team of medical students were given sole responsibility of administering PROMs to patients and sharing the results with clinicians. The students had volunteered to take part in the PROMs rollout and had been extensively trained on the goals of the project and operation of the electronic interface. They met with patients as they checked into clinic, delivered a brief explanation of the PROMs project, and handed out the tablets. Patients were granted privacy in a dedicated section of the waiting room, in order to minimize social desirability bias, but the students remained available nearby to answer any questions. Once the patient had completed the questionnaire and returned the tablet, the student printed out the responses and compiled them with other paper intake forms. This information was then provided to student clinicians and attending physicians, so that they could use the PROMs results to tailor their patient encounter, assessment, and plan.

Going into the pilot, we had several concerns. We feared that the tablets might prove to be too difficult to use and that that patients would be unwilling to complete all of the questionnaires. On the clinician side, we worried that clinic staff would

Theme	Frequency (n=9)
Concern for personal safety	4/9
Lack of social support	8/9
Transportation/location affecting access to care	4/9
Insurance concerns affecting access to care	3/9
Lack of control in the shelter system	5/9

Table 2. Common themes of interviews.

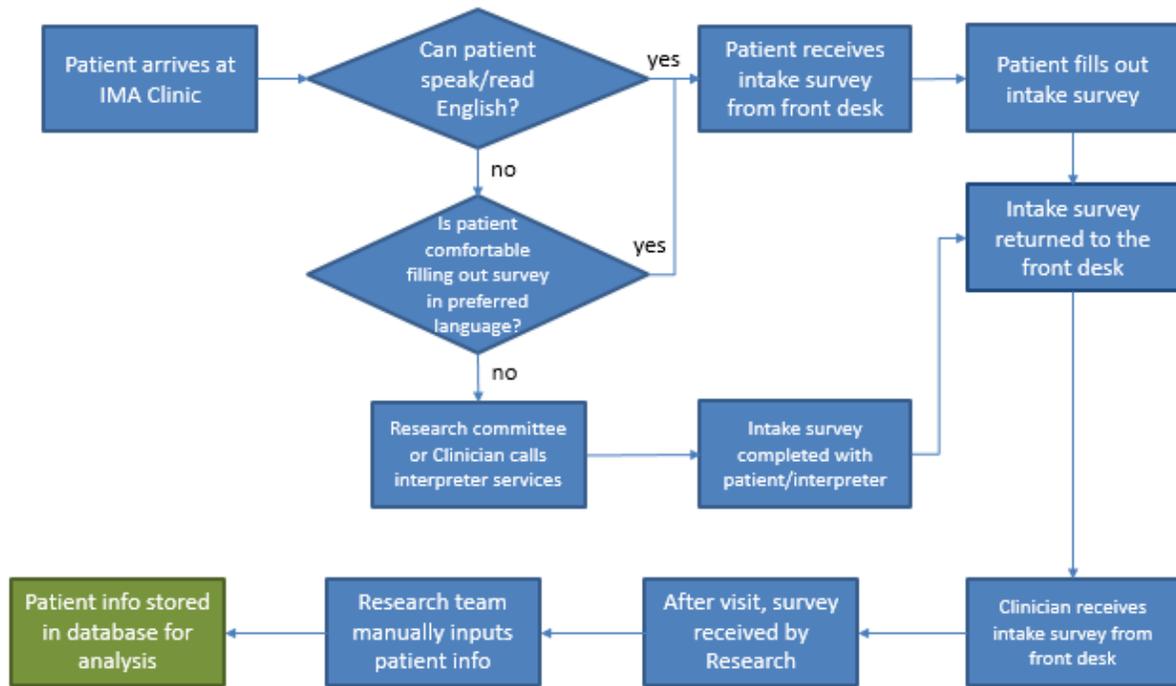


Figure 2: Current flow of patient information during a clinical visit

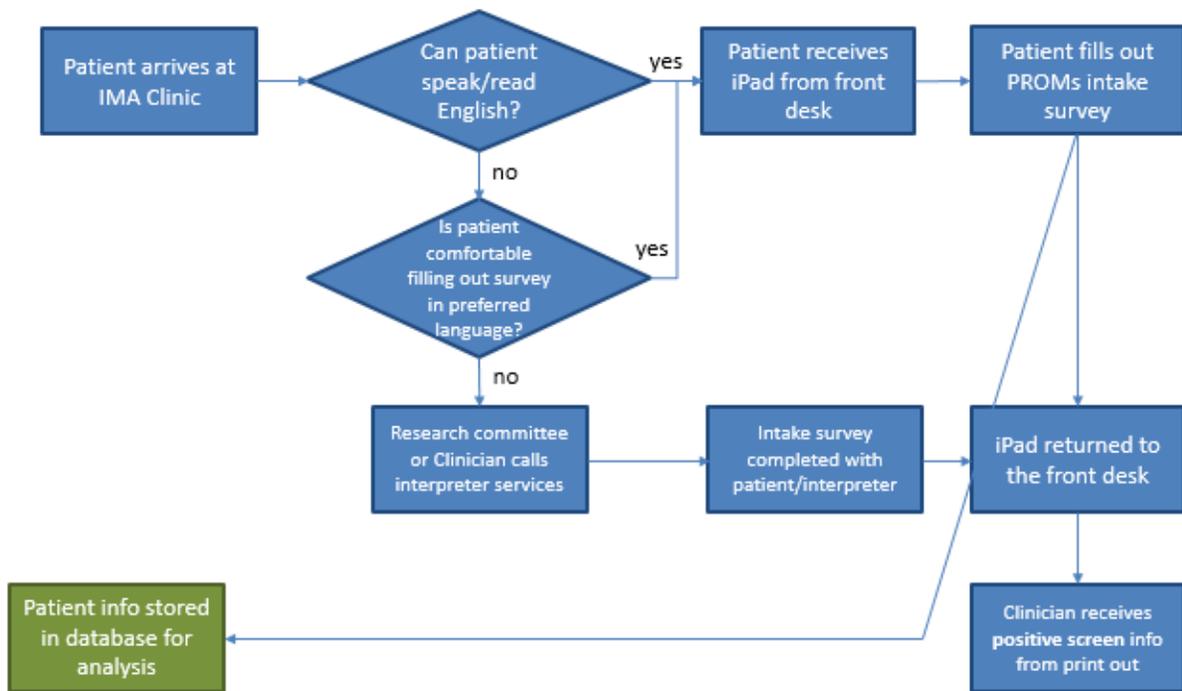


Figure 3: Future flow of patient information utilizing electronically-captured PROMs during a clinical visit

not be receptive to the project, that students and physicians might not look at the responses, or worse yet, that the data would not be valued. However, these concerns were largely unfounded. The iPads and Tonic interface proved to be intuitive to most patients, and the questionnaires took just under four minutes to complete on average. Medical assistants, nurses, and physicians in the clinic were open to the idea of digitally-presented questionnaires and intake forms, and largely reported that they hoped it would reduce administrative burden in the future. A majority of student clinicians said that they reviewed their patients' PROMs results, and several indicated that they learned something that they otherwise might not have asked about. Based on these results, the student and faculty leaders of the clinic decided to fully implement PROMs.

Implementation

In order to ensure a smooth, full-scale rollout, the team provided extensive training to all of the students and staff in clinic. Once up to speed, student and faculty clinicians began administering the PROMs questionnaire to their individual patients. PROMs was further integrated into the other operations of the clinic as well. Many student clinicians now rely on PROMs to guide and complement their history taking. Student researchers have used aggregated PROMs results to better understand the clinic's patient populations and their needs. The CCC clinic at MGH also has a student-run community-outreach function that connects patients with local social services. Students in this function analyze PROMs and proactively counsel those patients in need of assistance. Finally, PROMs have been continuously collected now for more than a year, and though a few paper intake forms are still used in clinic, the electronic collection and reporting of patient information has streamlined operations.

Discussion

Implementation of PROMs

We implemented a patient reported outcome measurement system in a student-faculty clinic. The

introduction of PROMs has streamlined clinical operations and aided the education of student clinicians. In the future, we expect that it will allow us to better characterize the range of patient outcomes at our clinic, quantify the quality of our care, track outcomes over time, and inform future quality improvement projects.

The health services literature contains many examples of patient-centered quality improvement projects⁹⁻¹⁰. However, there have been relatively few reports from student-run clinics and none concerning the use of PROMs¹¹⁻¹⁵. Defining and tracking patient outcomes is the first step in healthcare value creation, but further action must be taken to achieve meaningful quality improvement¹⁶. Until recently many technological and operational barriers stood in the way of an effective PROMs implementation⁵. But, as more practitioners succeeded in establishing PROMs in their clinics, their experiences helped to guide future projects^{2,3,17-21}. While each project was unique, they all uncovered common requirements that appear necessary for a successful PROMs implementation.

- *General Design and Implementation:* PROMs should be tailored to individual clinical settings. Specific project coordinators responsible for the implementation should be identified and empowered. PROMs are most useful when used as a complement to clinical intuition, and not as a strict specification.
- *Patient Acceptance:* Patients should not be inconvenienced by filling out PROMs surveys, and should be able to see the value of their participation. Response rates are improved by a simple user-interface.
- *Clinician Support:* Actively engaging clinicians in the design and implementation of PROMs is likely to build consensus among eventual users. Educating them about the potential costs and benefits of PROMs throughout the entire implementation process is important. Clinicians will be encouraged to utilize PROMs if the results are relevant, validated, and actionable.

Educational Value of PROMs

Medical education was bolstered by PROMs in 3 main ways; first, by increasing awareness of social determinants of health, second, by empowering students to initiate sensitive conversations with their patients, and third, by exposing trainees to systems-based practice and quality improvement.

Recently, within medical education, there has been a focus on understanding and intervening on the social determinants of health²². Student-run clinics are well positioned to expose students to underserved patient populations with complex medical, social, and emotional needs. Caring for these patients often requires a sensitive clinical approach, especially when broaching difficult topics like substance abuse, suicidal ideation, or intimate partner violence. Starting a conversation around such issues is hard and may be skipped during clinical encounters, even among seasoned physicians²³. Medical trainees thus face trepidation when approaching complex patients. Upon implementing PROMs at CCC, each patient's results have been provided to student clinicians before entering the examination room. In many instances, these results have uncovered a social or medical issue that the student may not have inquired about on their own. Students have then felt encouraged to start conversations with their patients, gaining familiarity and comfort with difficult subjects. As early acquired and oft-performed behaviors are more likely to influence clinical practice²⁴, the use of PROMs in a student-run clinic may improve the future ability of medical trainees to address their patients' concerns.

The integration of PROMs into student-run clinics also introduces trainees to systems-based practice, one of the 6 core competencies laid out by the Accreditation Council for Graduate Medical Education (ACGME)²⁵. In an era of accountable care—where physicians are increasingly expected to improve healthcare delivery and optimize the value to patients—student-run clinics offer a unique opportunity for future providers to gain hands-on experience. The use of PROMs allows students to

better understand their patients' needs and desires, and to optimize the value of every clinical encounter.

We believe that the educational prospects of PROMs are significant. However, to the best of our knowledge, no studies to date have outlined the possible role of PROMs in medical education. In fact, a review of the wider literature on medical education suggests that new methods are needed to effectively teach students about patient safety and quality improvement. Despite endorsements from the American Association of Medical Colleges (AAMC) and ACGME, only 25% of medical schools in the US include these topics in their curricula^{2,25}. Even among practicing physicians, continuing education rarely touches on methods of quality improvement²⁶. In response, the Institute of Healthcare Improvement outlined strategies to correct these deficits in quality improvement education²⁷. One such recommendation is to foster novel, hands-on student experiences, much like the PROMs project at CCC, and we believe that our experience can be replicated at other medical schools and student-faculty clinics.

Considerations

While we believe that our experience can serve as a model for other student-run clinics, it is important to note that it may not be generalizable to all settings. Our project was conducted at a unique, student-faculty collaborative clinic that is able to bill for its services. Faculty at the clinic have unique obligations to track and improve the quality of the care provided, and as such, empower students to undertake novel quality improvement initiatives. Likewise, we obtained outside support in the form of a grant from the HMS Center for Primary Care and technology development resources from MGH. Despite our straightforward experience with implementation, other student-run clinics without the same resources may experience difficulties. Additionally, we have not yet run into problems around patient acceptance, operational integration, or security of the tablet computers, issues of potential future concern. Finally, like any other

clinical innovation, PROMs has the potential for misuse and patient harm²⁸⁻²⁹, and any future projects should be careful to ensure proper implementation and evaluation.

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