Evaluation of a Group Prenatal Care-based Curriculum in a Family Medicine Residency

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BACKGROUND: There is a growing trend within family medicine residency training programs to implement group prenatal care programs. While the clinical benefits of group prenatal care have been well documented, there have been no published studies to date evaluating the educational impact of using group prenatal care in residency training programs.

METHODS: A retrospective cohort study of both patient care performance and outcome measures over a 4-year time span in a pre- and post-intervention design in a single family medicine training program was used.

RESULTS: A total of 184 women were cared for by residents educated under the old curriculum, and 195 women were cared for under the new curriculum. Patients cared for by residents under the new curriculum had significantly fewer cesarean sections compared to patients cared for under the old curriculum (17.53% versus 26.92%) and also trended toward having a lower rate of preterm births (4.15% versus 8.33%) that reached significance when controlled for parity and insurance status.

CONCLUSIONS: The ultimate measure of how well we train our residents is how well they care for their patients. Our evaluation of teaching residents maternity care through group prenatal visits and the IMPLICIT quality improvement initiative found that we improved not only several processes of care outcomes but most importantly the key maternity care outcomes of cesarean section and preterm birth rates.

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There is a growing trend within family medicine residency training programs to implement group prenatal care programs in their family health centers as a tool to provide a better Patient-centered Medical Home. While the clinical benefits of group prenatal care (particularly the Centering Pregnancy program) have been well documented,[1-5] there have been no published studies to date evaluating the educational impact of using group prenatal care in residency training programs. While there are many ways to measure the educational inpacts of curricular change, the ultimate way to evaluate the value and impact of a new training curriculum is to measure the quality of the patient care delivered by the residents who received the training. This study evaluated the impact of a group prenatal care curriculum implemented in a low maternity volume family medicine residency on the quality of prenatal and maternity care delivered in that residency practice.

Description of the Group Prenatal Care Curriculum

Most current educational models have obstetric and family medicine residents learning prenatal care through didactic teaching, reading articles and textbooks, and through apprenticeship where residents provide prenatal care to patients in the office setting. This method of teaching is appropriate for teaching the "rules" and protocols of prenatal care but may not be the best method for teaching the essential skills of patient education and counseling that are crucial in prenatal care. The old maternity care curriculum occurred primarily during individual precepting sessions where the care of the one or two prenatal patients seen that session was reviewed. In addition, there were regularly scheduled didactic sessions (about six sessions/year) focused on improving the quality of prenatal care in our office using the IMPLICIT network (Interventions to Minimize Preterm and Lowbirth weight Infants

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through Continuous Improvement Techniques)[6] quality improvement (QI) measures.

The new maternity care curriculum was centered around providing prenatal care in a group setting using the Centering Pregnancy Model. The Centering model encourages a patient-focused approach that allows flexibility in the curriculum, based on the concerns of the group members during each session. Key faculty members (those providing or planning to provide intrapartum care) attended the 2-day Centering Pregnancy (CP) Facilitator's Training workshop and were identified as preceptors for resident prenatal groups. Each academic year was divided into eight blocks (6–7 weeks) and a resident team consisting of one second-year (R2) and one third-year (R3) resident was assigned to care for all women due in that block (these blocks also existed in the old curriculum to facilitate a continuity delivery call schedule). This two-resident team was also assigned to co-facilitate a prenatal group of their patients due in that block period. Patients were highly encouraged to enroll in group visits but could choose group or traditional care with the same resident team. The group prenatal visit occurred in place of a regular continuity patient care session. The visit was precepted and co-facilitated with one of the CP-trained faculty. Prior to the visit, residents reviewed the topics to be discussed during that session using materials from the Centering Facilitator's Guide and materials developed by the faculty and prior residents who had participated in the curriculum. At the end of each visit, the preceptor met with the resident team to review the group session, facilitation and counseling techniques, and the medical management of all patients assigned to that team. There was an annual overview lecture on group prenatal care and CP given to the entire residency and monthly OB QI meetings for the entire residency, which reviewed key QI measures through the IMPLICIT network. Initial faculty training and curricular resources were funded through a New York State March of Dimes Community Grant.

Methods

The setting for this evaluation is an 8-8-8 US urban family medicine residency program sponsored by an academic medical center that included an OB-GYN residency. The family health center (FHC) was located at an affiliated federally qualified community health center (FQHC). The residents provided all maternity care for the FQHC site, which delivered between 80–120 patients per year during the time span of this evaluation. Prior to the implementation of this curriculum, the practice had joined the IMPLICIT network and was therefore closely measuring patient outcome and process of care quality measures.

This evaluation is a retrospective cohort study of both patient care performance and outcome measures in a pre- and post-intervention design. Patients who were delivered by the 32 residents in their second or third year of residency between June 1, 2006, and June 30, 2010, were included in the study.

Data were abstracted for patients who were cared for by residents prior to implementing the formal group prenatal care curriculum in June of 2008 and those who were cared for by residents after the implementation of the curriculum. The data were in two databases from ongoing studies and quality improvement activities: the IMPLICIT study and a study looking at patient satisfaction and adherence to group prenatal care. All patients who were in either database and had at least some delivery information entered (either delivery date, birthweight, mode of delivery, or gender of infant) were included in the final dataset for analysis. Patients who were delivered in "blocks" prior to the 2008–2009 academic year were classified as care under the old curriculum (control group) and patients who delivered in blocks after June 2008 were classified as care under the new curriculum (intervention group). It is important to note that in both groups there were patients who received prenatal care in groups and in the traditional model of care. Our definition of cohorts was based on the curriculum used to teach their resident doctor maternity care, not the mode of prenatal care used for that specific patient. We used *t* tests for continuous variables and chi-square for dichotomous and categorical variables. Logistic regression analysis was used to explore and control for potential confounders, when appropriate. This project was reviewed and approved by the Institute for Family Health Institutional Review Board.

Results

A total of 184 women were cared for by residents educated under the old curriculum, and 195 women were cared for under the new curriculum. There were no significant differences between these two time periods in measured characteristics of the women, although there were trends toward more women with government insurance in the new curriculum group (74.23% versus 67.03%, P=.125) and more multiparous women in this group (35.57% versus 26.78%, P=.066). Overall, the average age for this cohort of women was 27 years and was very diverse in terms of ethnicity (20.32% white, 26.65% black, 36.41% Hispanic, 5.01% Asian, 11.61% other/mixed). As expected, both groups had women who received prenatal care in the group setting. In the old curriculum, 18% of patients were in group care as part of our pilot initiatives, while in the new curriculum almost half (47%) received care in a group setting (Table 1).

Patients cared for by residents under the new curriculum had significantly fewer cesarean sections compared to patients cared for under the old curriculum (17.53% versus 26.92%, P=.028). Given the trends for differences between the groups in number of multiparous

Table 1: Demographics

	New Curriculum (n=195)	Old Curriculum (n=184)	*P* Value
Age (mean)	27.12 years	27.40 years	.6662
Multiparous (%)	35.57%	26.78%	.066
History of preterm birth	8.42%	11.94%	.395
Government insure (%)	74.23%	67.03%	.125
Ethnicity (%)			.256
White	16.92%	23.91%	
Black	26.15%	27.17%	
Hispanic	37.95%	34.78%	
Asian	4.62%	5.43%	
Other	14.36%	8.70%	
Received group care (%)	47.18%	18.48%	<.001

and government insured patients, we controlled for these potential confounders using a logistic regression model that only slightly reduced the effect size (unadjusted odds ratio [OR]=0.58 versus adjusted OR=0.61) although the confidence interval does cross the null effect. Patients cared for under the new curriculum also trended toward having a lower rate of low birth weight (4.76% versus 8.47%, *P*=.152) and preterm birth (4.15% versus 8.33%, *P*=.093) compared to patients cared for under the old curriculum. We again controlled for multiparous and government insurance status, which increased the effect size significantly for a reduction in preterm birth (OR=0.48 versus adjusted OR=0.39, *P*=.045) and near significance for low birth weight rate (unadjusted OR=0.54 versus adjusted OR=0.53, *P*=.067) (Table 2).

We also examined for any effects on our process of care quality measures that were being monitored as part of the IMPLICIT project both before and after the new curriculum was implemented. We found significant improvement in first-trimester smoking screening rates (97.30% versus 85.25%, *P*<.001), postpartum smoking screening rates (76.92% versus 42.64%, *P*<.001), and postpartum depression screening rates (63.73% versus 50.79%, *P*=.05) (Table 3) with the new curriculum. We also found significant decreases in postpartum visit rates (60.94% versus 75.29%, *P*=.004) and third-trimester postpartum contraception counseling rates (76.4% versus 91.12%, *P*<.001) (Table 3).

Discussion

The ultimate measure of how well we train our residents is how well they care for their patients. Our evaluation of teaching residents maternity care through group prenatal visits and the IMPLICIT quality improvement initiative found that we improved not only several processes of care outcomes but most importantly the key maternity care outcomes of cesarean section and preterm birth

Table 2: Patient Care Outcomes

	New Curriculum (n=195)	Old Curriculum (n=184)	*P* Value	Unadjusted OR	Adjusted OR*	Adjusted *P* Value
LBW rates	4.76%	8.47%	.152	0.54 (0.20, 1.36)	0.43 (0.18, 1.06)	.067
PTB rates	4.15%	8.33%	.093	0.48 (0.17, 1.23)	0.39 (0.15, 0.98)	.045
Cesarean rate	17.53%	26.92%	.028	0.58 (0.34, 0.97)	0.61 (0.37, 1.01)	.053

* Adjusted for multiparous and insurance status

OR—odds ratio

LBW—low birth weight

PTB—preterm birth

Table 3: Process of Care Outcomes

	New Curriculum (n=195)	Old Curriculum (n=184)	*P* Value
% screened smoking 15 weeks	97.30%	85.25%	<.001
% screened smoking 30 weeks	84.09%	86.21%	.578
% screened smoking postpartum	76.92%	42.64%	<.001
% screened depression 15 weeks	7.34%	8.54%	.722
% screened depression 30 weeks	54.29%	58.48%	.432
% screened depression postpartum	63.73%	50.79%	.05
% screened ASB 15 weeks	96.70%	95.60%	.586
% positive ASB treat 15 weeks	92.86%	86.05%	.375
% counseled family planning prenatal	76.40%	91.12%	<.001
Induction rate	26.47%	28.87%	.636
Postpartum visit (%)	60.94%	75.29%	.004

ASB—asymptomatic bactiuria

rates. The preterm birth rate reduction and trend toward reduced low birth weight rates were somewhat expected given group prenatal care has been associated with a reduction in these outcomes in previous studies.[5,7] This study differs significantly from these previous studies because we evaluated patient outcomes by the clinician's exposure to using group prenatal care instead of the individual patient's exposure to this different model of care. We hypothesize that these differences in outcomes are due to residents applying skills learned providing group care to the individual care patients they see in the same time period, thus benefiting all their patients. Since many women do not agree to participate in group prenatal care for themselves, it is encouraging to see that offering group prenatal care in a residency practice can benefit all patients and not just the patients who choose to directly participate in a prenatal group.

An unexpected result of our curricular change was the drop in cesarean section rate. This was not a direct objective for the curricular change. While the reduction in cesarean section rates was borderline in statistical significance, it is more clinically significant when viewed in the context that this evaluation occurred between 2006 and 2010 when cesarean section rates rose nationally from 31.1% in 2006 to 32.9% in 2009 (last year of known data) and in our local environment remained critically high at 27% between 2006 and 2008 (last year of known data).[8,9] As a comparison, our practice cesarean section rate went from 26.92% in 2006–2008 (similar to the hospital rate) to 17.53% in 2008–2010. We feel that this unintended consequence of the group prenatal care curriculum is due to the fact that while residents were doing more direct counseling and education with patients in groups about childbirth preparation, they were learning more about how to better counsel all their patients about early labor and specifically how to help patients stay home and cope with early labor pains, thus avoiding early labor admissions, a known risk factor for cesarean section.[10] In addition, these childbirth preparation sessions in the curriculum improved the labor support skills of residents, which also may have contributed to the reduction in cesarean sections.

Our process of care outcomes also showed some unexpected trends. Prenatal group visits occur in the second and third trimesters. Yet the improvements we did see in process of care quality measures were in the first trimester (smoking screening) and postpartum (smoking and depression screenings). These effects may reflect the QI efforts as part of IMPLICIT and are also consistent with our observations that the process of learning prenatal care through group visits impacted how residents viewed and treated all their patients. The negative impact on third-trimester screenings (when some of these patients were actually in group care) was concerning. Toward the end of the first year of the group prenatal care curriculum, the FHC changed its prenatal care documentation from a hybrid of paper ACOG prenatal charts with some electronic documentation in the EHR, to a complete EHR-based prenatal chart. During the subsequent 6 months, all process of care quality measures that changed charting process showed a significant decrease that then slowly improved. In addition, we also observed that charting individual counseling measures

electronically was more difficult with the group patients as we did not have consistent access to the records in our group space. This is an important consideration for other family medicine residencies to consider as they work to implement group medical visits while also using electronic health records.

Limitations

There are several limitations to this study. The most significant is limited external validity due to this being an evaluation of a curriculum in a single family medicine residency. This is an evaluation of a group prenatal curriculum in a low volume maternity care program, although we believe that the results would likely apply to other similar settings. As more family medicine programs implement group prenatal visits, programs should collaborate to evaluate the impact of the curriculum on all their patients (both those in groups and traditional care) in multiple settings.

As in any retrospective cohort study that involves chart review, there are concerns with misclassifiaction bias and missing data. Since the data used in this study was collected for other purposes (the IMPLICIT QI program and patient satisfaction with group prenatal care), any misclassifiaction bias would be random, and this would bias our results toward the null hypothesis. Missing data were excluded from analysis, which slightly reduced our power for certain comparisons.

The pre- and post-intervention design also has several limitations. The most concerning is the introduction of unmeasured confounders due to the population changing with time. We tried to control for some of this by controlling for multiparous status and government insurance status for the patient care outcomes. Over the course of the 4 years of this study, many unmeasured factors did not change, such as the attendings who had intrapartum privileges in the program, the attendings who precepted the prenatal groups, and the general demographics of the residents who completed the residency during this time. This leads us to believe that we are likely comparing similar populations and settings (except for the intervention being measured). Finally, the study was a convienience sample based on the availability of control group data for 2 years prior to the intervention. This meant that the control group included patients cared for by residents who participated in our pilot prenatal groups. Residents self-selected for pilot groups, so tended to be more motivated, knowledgable, and skilled in prenatal care prior to participating in groups. We chose to keep this group in the old curriculum to avoid selection bias. We also felt that these groups were run differently than the new curriculum as there was an element of curriulum development occurring (faculty not as experienced with group facilitation, materials not developed, etc) during this time, so there was not a full implementation of the curriculum. The study was also done in a relatively low volume program. This limited the power of the study, particularly when looking at patient care outcomes.

Strengths of the Study

On the other hand, there are several strengths to this study. Most important is that we eliminated selection bias by looking at our entire practice before and after we fully implemented a group prenatal care curriculum. Previous studies looking at group prenatal care compare outcomes based on the setting (group versus individual care) in which the patient received care. In cohort studies, this introduces a strong selection bias as women who choose group care are likely different in ways not measured to women who decline group care. We also looked at the "patient-oriented outcome" of a curricular change as opposed to the intermediate outcomes of changes in medical knowledge or attitudes and had a defined control group as opposed to the more traditional pre-curriculum and post-curriculum survey or testing of residents.

Future Directions

As more family medicine programs investigate implementing group prenatal programs, they should focus their evaluation efforts on the impact of their curriculum on patient outcomes for all patients, not just group patients. Based on our experience, we recommend that programs strongly consider designing their group programs so that residents are the lead facilitators as opposed to the faculty/preceptor, as we feel this enhanced the resident training experience and supported the continuity of care model. We also found that we were able to sustain our group prenatal program beyond the initial grant funding by formally training faculty using the Centering Pregnancy program in a "train the trainer" type model and then have residents apprentice with the trained preceptor.

As noted in this study, relatively small changes in a curriculur model can lead to significant improvements in the patient-centered outcomes of preterm birth and cesarean section rates. Further studies should examine other outcome measures of the group prenatal curricular model such as cost-effectiveness, resident satisfaction with their obstetrical training, and practice outcomes such as differences in the proportion of family medicine residents practicing obstetrics after graduation in addition to evaluating similar patient outcomes in other settings.

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