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Annals of Pregnancy and Care

Research Article

The Impact of Pregnancy on Resilience in Women Seeking Obstetric Care at an Urban Community Health Center

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Submitted: 30 June 2017

Accepted: 10 August 2017

Published: 11 August 2017

Keywords
- Resilience
- Pregnancy
- Social support
- Stress
- Prenatal care

Abstract

Introduction: Pregnancy and childbirth, as significant life events, are often associated with stress, which in turn is associated with poor perinatal outcomes. Resilience may mediate these outcomes, but there is limited research on how resilience changes during pregnancy. We aimed to measure the change in resilience from a prenatal to a postnatal period and identify associated factors.

Methods: We conducted a mixed methods prospective cohort study at an urban community health center. Surveys were conducted at two time points: prenatal after 20 weeks' gestation and postnatal up to 12 weeks postpartum. Interviews were conducted among a subset of participants and were analyzed to identify themes important in understanding the context of pregnancy and childbirth. A retrospective chart review was conducted to assess antepartum, intrapartum, and postpartum factors.

Results: Twenty-six participants were included in the study. While the mean resilience score increased between the prenatal and postnatal time points, this change was not statistically significant. There were no demographic or psychosocial factors, medical history, or obstetric factors associated with change in resilience, except for diagnosis of a sexually transmitted infection during pregnancy, which was associated with a decrease in resilience. Social support, a positive outlook, and self-efficacy were prominent themes identified from the interviews.

Conclusion: Quantitative data did not demonstrate significant changes in resilience as a result of maternal or obstetric factors, but qualitative interviews revealed important themes to understand the role resilience may play in pregnancy, or conversely how pregnancy may shape resilience. Future studies should explore resilience scores at different time points in the postnatal time period and further account for the role of social support and self-efficacy in mediating resilience.

INTRODUCTION

Pregnancy and childbirth are significant life events, often associated with stress. Substantial research has evaluated the effect of both physical and psychological stress on pregnancy [1,2], and significant relationships between stress in pregnancy and both low birth weight and preterm birth have been noted [3-5]. Coping strategies and personal resources, such as self-efficacy, also have been examined [2] and appear to modulate the stress response in pregnancy [6]. The complex interplay between stress and birth outcomes is not clear, however [2], and is an active area of research.

Resilience, the process of negotiating, managing, and adapting to significant stress or trauma [7], provides another lens through which to understand the relationship between stress and adverse perinatal outcomes. There are few studies assessing resilience during pregnancy, and studies that do exist have employed vastly different methodologies for measuring resilience. Little is known about the role resilience plays in mitigating the effects of stress in pregnancy, or conversely, how pregnancy and childbirth may change resilience.

As a dynamic entity, resilience changes in response to life events [7], creating an ebb and flow that contributes to human behavior and the subjective experience of life. Obstetric complications, which often diverge from one's expectation of pregnancy and childbirth, may lead to decreased resilience, mediated through loss of body or social capital [8]. Alternatively, trauma, one way of describing difficult childbirth or unexpected perinatal outcomes, could lead to post-traumatic growth [9] and an increase in resilience [10]. While women in one study with high resilience experienced less depressive symptoms and

better quality of life following preeclampsia [11], there also is speculation that external support and mindfulness could help frame a difficult event and lead to increased resilience [12,13]. For example, one study found that with appropriate support individuals can increase resilience and gain new life skills when faced with adverse obstetrics outcomes, such as stillbirth [14].

In our prior work [15], we found that lower resilience was associated with baseline depression, and higher resilience was associated with religious affiliation and financial security. These findings are consistent with prior literature identifying social support networks [16], financial stability, and baseline mental health [17] as important factors for resilience in women's health and pregnancy in particular.

In this study, we sought to measure the change in resilience from a prenatal to a postnatal period and identify factors that may be associated with a change in resilience as a result of pregnancy. In addition, we aimed to better understand the context of pregnancy and how it might explain any observed changes in resilience. Qualitative methodology was selected for this last objective to explore the context of pregnancy and the coping strategies women employ during this major life event.

MATERIALS AND METHODS

A prospective cohort study, applying quantitative and qualitative research methodologies, was conducted among a convenience sample of English-speaking women 18 years or older with singleton gestations ≥ 20 weeks' gestation who were receiving prenatal care at an urban community health center affiliated with an academic medical center. The health center provides prenatal care to approximately 100 patients per year. Participants were recruited from March to October 2014. Written informed consent was obtained from each study participant, and the health center institutional review board approved the study.

Quantitative Methods

A registered nurse verbally administered a paper-based survey in a private setting within the obstetrics clinicat two time points: 1) upon recruitment during pregnancy (prenatal) and 2) between 2 and 12 weeks following delivery (postnatal). The study co-investigators developed unique surveys, one for the prenatal assessment and another for the postnatal assessment. The prenatal survey included questions assessing demographic characteristics, as well as psychosocial, medical, and obstetric history, interpersonal support, financial resources, access to necessities such as housing, and exposure to violence. The postnatal survey included similar questions regarding social support, financial resources, and exposure to violence, as well as questions on the emotional experience of delivery, breast-feeding, contraception, and self-efficacy in parenting. Retrospective medical record review was conducted after the completion of both surveys to validate medical and obstetric history and to determine antepartum, intrapartum, and postpartum factors, which are collectively referred to as obstetric factors.

A history of anxiety and depression was assessed by patient self-report and medical record review, and depressive symptoms were assessed by the Patient Health Questionnaire-9 (PHQ-9), conducted at the time of the surveys. A PHQ-9 score ≥ 7, the cutoff used by the clinic to identify patients in need of a same-day behavioral health assessment, was considered to be indicative of depressive symptoms. Preterm delivery was defined as delivery prior to 37 weeks' gestation. Excessive gestational weight gain was defined by weight gain in excess of the recommendations from the Institute of Medicine [18].

Resilience was measured by the Connor-Davidson Resilience Scale (CD-RISC), which has been validated in numerous settings [19]. The CD-RISC is one of the three most common scales used to assess resilience [20], and it has been used in a prenatal population [17].The CD-RISC is comprised of 25 items, each rated on a 5-point scale (0-4), with higher scores reflecting greater resilience [21]. The CD-RISC includes five factors [21]: I) personal competence, high standards, and tenacity (8 items); II) trust in one's instincts, tolerance of negative effect, and strengthening effects of stress (7 items); III) positive acceptance of change and secure relationships (5 items); IV) control (3 items); and V) spiritual influences (2 items).

Survey and medical record data were collected and managed using RED Cap; an electronic data capture tool [22]. Statistical analysis of quantitative data was performed using SAS 9.4 (SAS Institute Inc., Cary, NC). Data are reported as median (interquartile range) or proportion. Wilcoxon signed-rank tests were used to compare between prenatal and postnatal resilience scores.

Qualitative Methods

Every fifth person who completed the survey was invited to participate in a semi-structured audio-recorded interview. The interview guide was developed by the study team and included open-ended questions about life circumstances, potentially stressful situations, coping strategies, interpersonal support, personal strengths, and experiences and concerns related to the pregnancy. The interviews were audio-recorded, transcribed and analyzed using Dedoose (http://www.dedoose.com).

For the qualitative analysis, a coding scheme was developed by one of the authors (KJ) and confirmed by two other authors (JS and FP). This scheme was based on iterative review of the interview transcripts and grounded in theory by Dunkel-Schetter [2], in which resilience was interpreted as a result of multiple inputs, including prior experiences, personal outlook, self-efficacy, resource management, and response to challenges. Two investigators (KJ and FP) coded the interviews individually and any discrepancies were discussed to reach consensus. Prior to re-coding, the inter-rater reliability, as measured by Cohen's kappa coefficient, was 70%. Following resolution of discrepancies, the inter-rater reliability was 99%.

RESULTS AND DISCUSSION

Quantitative Results

Thirty participants completed the prenatal survey, of which twenty-six participants completed the postnatal survey. The response rate for the prenatal surveys and interviews was 100%. Of those who did not complete the postnatal survey (n=4), one declined to continue participation and three were lost to follow-up after three attempts to contact the participants.

Participant characteristics can be seen in Table 1. The majorities of participants were black, had completed at least a high school or equivalent degree, and were employed (Table 1). Most had at least one dependent and more than 75% were enrolled in the Women Infants and Children Nutrition Program (WIC).

Median resilience scores were similar in the prenatal period [82 (74 - 92)] and the postnatal period [84 (73 - 89), p = 0.87, Table 2]. When stratified by the five factors previously defined by Connor et al. [21], the overall resilience score did not change significantly from the prenatal to postnatal time period (Table 2).

Obstetric factors, organized by antepartum, intrapartum, and postpartum factors, were evaluated with respect to their association with resilience in the prenatal versus postnatal time periods (Table 3). There were no statistically significant changes in resilience scores from the prenatal to postnatal period, when stratified by antepartum, intrapartum, or postpartum factors, except for diagnosis of a sexually transmitted infection (STI) during pregnancy [84 (75 - 96) versus 82 (65 - 88), p = 0.02]. We also stratified change in individual factors (Factors I-V) of the CD-RISC scale by obstetric factors, and observed no significant change in scores (data not shown).

Table 1: Participant characteristics.

Characteristic	n=26
Demographics	
Maternal age at enrollment (years)	26.5 (23.0-32.0)
Race[a]	
Black	19 (73.1)
Caucasian	3 (11.5)
Haitian/Caribbean	3 (11.5)
Other	5 (19.2)
Ethnicity	
Non-Hispanic	21 (80.8)
Hispanic	5 (19.2)
Education	
Completed some college or higher	11 (42.3)
Completed high school or GED	10 (38.5)
Less than high school completed	5 (19.2)
Employed	18 (69.2)
Married	3 (11.5)
Number of dependents	
None	6 (23.1)
1 or 2	17 (65.4)
3 or more	3 (11.5)
Medical/obstetric characteristics	
Gravidity	4.0 (2.0-6.0)
Parity	1.0 (0.0-2.0)
Nulliparous	8 (30.8)
Medical comorbidities (hypertension, diabetes, asthma, or other)	7 (26.9)
Body mass index > 30	9 (34.6)
Smoking during pregnancy	7 (26.9)
Alcohol use in pregnancy	2 (7.7)
Positive urine toxicology	8 (30.8)
Resources	
Enrolled in Women Infants and Children Nutrition Program	20 (76.9)
Finances at the end of the month	
Some money left over	11 (42.3)
Just enough to make ends meet	12 (46.2)
Not enough to make ends meet	3 (11.5)

Data are presented as median (interquartile range) or n (%)
[a]Participants could choose more than one option; thus, numbers do not add to 100%

Table 2: Overall resilience and resilience score by factor.

	Prenatal Resilience n=26	Postnatal Resilience n=26	p
Overall	82 (74-82)	84 (73-89)	0.87
Factor			
I: Personal competence, high standards, tenacity	28 (24-31)	29 (26-31)	0.42
II: Trust on one's instincts, tolerance of negative effect, strengthening effects of stress	19.5 (17-23)	20 (17-22)	0.15
III: Personal acceptance of change and secure relationships	16 (14-18)	17 (14-19)	0.60
IV: Control	11 (9-12)	11 (9-12)	0.59
V: Spiritual influence	8 (6-8)	7 (5-8)	0.45

Data are presented as median (interquartile range)

In addition, medical and obstetric history and social support characteristics were evaluated to assess their association with change in resilience (Table 4A-C). There were no statistically significant changes in resilience scores when stratified by these maternal characteristics.

Qualitative Results

Ten participants were interviewed, with five interviews conducted during the prenatal period (>20 weeks' gestation) and five interviews conducted during the postnatal period (up to 12 weeks after delivery). The participants interviewed were a subset of the larger population (Table 5). Of the five who completed a semi-structured interview in the prenatal period, one participant also completed an interview in the postnatal period.

The obstetric history and significant obstetric events during the concurrent pregnancy are noted in Table 5. Some participants experienced no complications, and others, such as Participant 3, experienced several complications during the concurrent pregnancy. Resilience scores, both prenatal and postnatal, are listed for each participant. One of the participants interviewed did not complete a postnatal survey, and thus the postnatal resilience score is missing. Of those who completed both pre and postnatal surveys, the resilience scores increased for four participants and decreased for four participants. It is not clear why scores increased for some and not others, although all of the participants with a history of depression experienced a decrease in resilience scores.

Changes in resilience, based on factors (I - V), are also shown

in Table 5. No clear pattern of factor change emerged among those interviewed. The interviews allowed for more in depth exploration of the relationship between resilience and pregnancy, and several themes emerged (Table 6).

First, many of the participants reported significant life challenges, whether financial, medical, or emotional, and described ways of dealing with challenges (Table 6).

One of my biggest strengths is being able to work under pressure and trying to pull a positive out of a negative…one of my biggest [challenges] is going on maternity leave and it's unpaid, so me trying to live without income…I'll deal with it as it comes (Participant 3).

I was probably hospitalized about five times…but I still worked full time. Kept my life going, stayed strong, no matter

Table 3: Prenatal and postnatal resilience scores with respect to overall population and stratified by antepartum, intrapartum, and postpartum factors.

	n (%) n = 26	Prenatal resilience	Postnatal resilience	p
Antepartum Factors				
Admission during prenatal period				
Yes	6 (23.1)	90.5 (83-92)	89.5 (88-92)	0.89
No	20 (76.9)	79.5 (70.5-86)	82 (72-87)	0.82
Anomaly detected at full fetal survey				
Yes	2 (7.7)	66 (58-74)	57.5 (49-66)	0.50
No	24 (92.3)	83 (75.5-92)	85 (79.5-89.5)	0.76
Number of prenatal appointments >10				
Yes	19 (73.1)	81 (75-92)	84 (77-88)	0.81
No	7 (26.9)	84 (68-92)	86 (72-91)	0.94
Beta methasone used				
Yes	2 (7.7)	96 (92-100)	90 (88-92)	0.50
No	24 (92.3)	80.5 (73.5-88)	83.5 (72.5-88.5)	0.90
Surgery during prenatal period				
Yes	3 (11.5)	84 (83-92)	82 (72-84)	0.50
No	23 (88.5)	80 (73-92)	86 (73-90)	0.71
Sexually transmitted infection diagnosed				
Yes	7 (26.9)	84 (75-96)	82 (65-88)	0.02
No	19 (73.1)	80 (73-89)	84 (77-90)	0.24
Excessive gestational weight gain, per Institute of Medicine Guidelines				
Yes	11 (42.3)	79 (68-92)	72 (73-84)	0.65
No	15 (57.7)	84 (75-92)	88 (72-91)	0.97
Intrapartum Factors				
Delivery induced				
Yes	15 (57.7)	89 (79-94)	88 (82-91)	0.46
No	11 (42.3)	76 (68-83)	72 (65-86)	0.66
Cesarean delivery				
Yes	5 (19.2)	89 (87-92)	91 (90-91)	0.38
No	21 (80.8)	79 (73-84)	82 (72-86)	0.71
Use of epidural				
Yes	18 (69.2)	83 (74-92)	85 (72-91)	0.35
No	8 (30.8)	79.5 (75.5-88.5)	83.5 (82-87.5)	0.34
Intrapartum complication[a]				
Yes	8 (30.8)	80 (71-94.5)	83 (69-89.5)	0.46
No	18 (69.2)	82 (75-89)	85 (77-89)	0.48
Preterm delivery				
Yes	2 (7.7)	83.5 (83-84)	78 (72-84)	1.0
No	24 (92.3)	80.5 (73.5-92)	85 (75-89.5)	0.92
Support person present for delivery				
Yes	24 (92.3)	83 (74,5-92)	83.5 (72.5-89.5)	0.48
No	2 (7.7)	74.5 (73-76)	85 (84-86)	0.50
Postpartum Factors				
Neonatal intensive care unit (NICU) admission				
Yes	4 (15.4)	88 (83.5-94.5)	87.5 (78-91)	0.38

No	22 (84.6)	79.5 (73-89)	83.5 (73-88)	0.75
Postpartum readmission				
Yes	1 (3.8)	84	72	1.0
No	25 (96.2)	81 (74-92)	84 (77-89)	0.92
Postpartum complication[b]				
Yes	6 (23.1)	83.5 (76-92)	84 (82-88)	0.88
No	20 (76.9)	80.5 (73.5-90.5)	84.5 (72.5-89.5)	0.72
Breast-feeding				
None	7 (26.9)	84 (80-96)	86 (77-90)	0.69
Any	19 (73.1)	79 (68-92)	83 (72-89)	0.39
Use of contraception at postnatal visit[c]				
Yes	17 (68.0)	83 (76-92)	84 (77-89)	0.51
No	8 (32.0)	81 (71.5-88)	80 (77-89.5)	0.46

Data are presented as median (interquartile range)
[a]Complications included shoulder dystocia, postpartum hemorrhage, chorioamnionitis, additional operating room procedure, other
[b]Complications included intensive care unit admission, endometritis, wound infection, preeclampsia, and receipt of blood products
[c]One woman had sterilization procedure and is not included, n = 25

Table 4A: Prenatal and postnatal resilience scores, stratified by items relevant to mental health and substance use history.

	n (%) n = 26	Prenatal resilience	Postnatal resilience	p
History of depression (medical record or self-report)				
Yes	10 (38.5)	70.5 (66-76)	77.5 (65-86)	0.57
No	16 (61.5)	86 (81.5-92)	88 (82-90.5)	0.27
History of anxiety (medical record or self-report)				
Yes	6 (23.1)	80 (75-87)	87 (86-91)	0.41
No	20 (76.9)	83 (71-92)	82.5 (72.5-88.5)	0.36
Ever medicated for anxiety, depression, or insomnia (self-report)				
Yes	6 (23.1)	74 (60-79)	79 (54-88)	0.75
No	20 (76.9)	83.5 (77.5-92)	84 (79.5-89.5)	0.46
PHQ-9 ≥7				
Yes	7 (26.9)	76 (60-84)	72 (54-86)	0.50
No	19 (73.1)	83 (74-92)	86 (82-90)	0.82
Substance use				
Yes	8 (30.8)	79.5 (75.5-88.5)	82.5 (71-86)	0.51
No	18 (69.2)	73 (73-92)	86 (73-91)	0.71

Data are presented as median (interquartile range) or n (%)
Abbreviations: PHQ-9: Patient Health Questionnaire-9

Table 4B: Prenatal and postnatal resilience scores, stratified by medical and obstetric history.

	n (%) n = 26	Prenatal resilience	Postnatal resilience	p
Maternal age				
<30 years	17 (65.4)	79 (73-87)	84 (73-88)	0.67
≥30 years	9 (34.6)	85 (83-92)	82 (82-92)	0.43
Smoking				
Yes	7 (26.9)	80 (60-85)	72 (65-88)	0.52
No	19 (73.1)	83 (75-92)	86 (82-91)	0.80
Body mass index >30				
Yes	9 (34.6)	89 (80-94)	89 (77-91)	0.45
No	17 (65.4)	79 (73-84)	83 (73-86)	0.79
Nulliparous				
Yes	8 (30.8)	89.5 (75.5-94)	88 (77-91)	0.52

No	18 (69.2)	79.5 (74-85)	83.5 (73-88)	1.0
Prior preterm delivery				
Yes	3 (11.5)	84 (83-89)	84 (72-84)	1.0
No	23 (88.5)	80 (73-92)	84 (73-89)	0.98
Prior pregnancy loss				
Yes	11 (42.3)	85 (79-94)	89 (84-91)	0.45
No	15 (57.7)	79 (68-87)	82 (66-86)	0.57
Prior obstetric complication[a]				
Yes	5 (19.2)	84 (79-89)	84 (83-91)	0.81
No	21 (80.8)	81 (73-92)	84 (73-88)	0.76
History of intimate partner violence, reported by survey				
Yes	13 (50.0)	79 (73-86)	83 (72-90)	0.83
No	13 (50.0)	83 (76-92)	84 (82-88)	0.53
History of intimate partner violence, present in medical record				
Yes	6 (23.1)	78 (68-84)	82 (72-86)	1.0
No	20 (76.9)	82 (75.5-92)	85 (75-89.5)	0.98

Data are presented as median (interquartile range) or n (%).
[a]Defined as placental abruption, uterine rupture, shoulder dystocia, hemorrhage, preeclampsia, or need for re-operation

Table 4C: Prenatal and postnatal resilience scores, stratified by social resources.

	n (%) n = 26	Prenatal resilience	Postnatal resilience	p
Religion affiliation				
Yes	20 (76.9)	84.5 (77-92)	86 (77.5-90.5)	0.35
No	6 (23.1)	74.5 (60-80)	80.5 (72-86)	0.31
Country of birth				
USA	20 (76.9)	82 (75.5-92)	85 (74.5-88.5)	0.59
Other	6 (23.1)	78.5 (68-87)	83 (73-91)	0.47
Married				
Yes	3 (11.5)	87 (74-100)	91 (66-92)	0.50
No	23 (88.5)	81 (73-92)	84 (73-88)	0.87
Lives in same household as the baby's father				
Yes	8 (30.8)	82 (71-89.5)	84 (74-89.5)	0.88
No	18 (69.2)	81.5 (75-92)	84 (73-89)	0.84
Finances at the end of the month				
Some money left over	11 (42.3)	87 (76-94)	88 (82-89)	0.78
Just enough to make ends meet	12 (46.2)	82 (74-87)	85 (72-90.5)	0.95
Not enough to make ends meet	3 (11.5)	66 (58-79)	73 (49-83)	1.0
Receives financial support from the baby's father				
Yes	17 (65.4)	83 (79-92)	84 (82-88)	0.72
No	9 (34.6)	75 (66-89)	83 (72-89)	1.0
Enrolled in Women Infant Children's program				
Yes	20 (76.9)	83 (77.5-92)	86 (82-89.5)	0.45
No	6 (23.1)	74.5 (68-84)	69 (54-82)	0.31
During pregnancy have you missed appointment because you had no transportation?				
Yes	4 (15.4)	75.5 (74-88)	85 (69-89)	1.0
No	22 (84.6)	83 (74-92)	83.5 (73-89)	0.88

During pregnancy was telephone/electricity/gas turned off?				
Yes	5 (19.2)	79 (76-84)	83 (72-84)	0.81
No	21 (80.8)	83 (73-92)	86 (77-89)	0.99
Lives in apartment or house				
Yes	19 (73.1)	83 (74-92)	83 (73-89)	0.75
No	7 (26.9)	81 (73-92)	86 (72-91)	0.94
Education				
Less than high school completed	5 (19.2)	83 (76-92)	84 (82-84)	0.88
Completed high school or GED	10 (38.5)	83.5 (73-89)	84.5 (72-90)	0.61
Completed some college or higher	11 (42.3)	80 (74-92)	86 (66-91)	0.57
Enrolled in group-based prenatal care[a]				
Yes	9 (36.0)	81 (75-92)	84 (72-88)	0.55
No	16 (64.0)	81.5 (70.5-88)	83.5 (75-89.5)	0.42

Data are presented as median (interquartile range) or n (%).
[a]One participant missing information, n = 25

Table 5: Participant characteristics for those who completed interviews.

Participant Number	Age	Gravidity/ Parity[a]	Timing of interview	Obstetric history	Obstetric events	Resilience score, pre-natal	Resilience score, post-natal	Areas of change[b]
1	27	G5P3	Prenatal	Shoulder dystocia	SVD, no complications	79	83	⌈ II ⌊ IV
2	21	G1P0	Prenatal	None	SVD, no complications	79	n/a	n/a
3	39	G4P1	Prenatal	PPROM, Hepatitis C, intravenous drug use	SVD, complicated by PPROM, PTD, chorio, PEC requiring readmission; postpartum depression	84	72	⌊ I –IV
4	46	G6P1	Prenatal	T2DM, DVT	CS, chronic abruption	89	94	⌈ III
5a	21	G5P0	Prenatal	SAB x 4 in setting of DV, depression	SVD, no complications	100	92	⌊ II –V
5b	21	G5P0	Postnatal	same as above	same as above	same as above	same as above	same as above
6	24	G3P1	Postnatal	cervical insufficiency, neonatal death	SVD, complicated by PEC, PTD	83	84	⌈ I ⌊ IV
7	31	G1P0	Postnatal	Obesity	CS, NRFHT, induced for hypertension	87	91	⌈ I, II
8	20	G1P0	Postnatal	Depression	SVD, no comps	68	65	⌊ III, V
9	23	G2P0	Postnatal	TAB	VAVD	96	88	⌊ II

[a]Parity at time of enrollment
[b]**Factor Definitions**: I = Personal competence, high standards, tenacity; II = Trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; III = Positive acceptance of change and secure relationships; IV = Control; V = Spiritual influences
Abbreviations: SVD: Spontaneous Vaginal Delivery; PPROM: Preterm Premature Rupture of Membranes; PTD: Preterm Deliver; PEC: Preeclampsia; Chorio: Chorioamnionitis; T2DM: Type 2 Diabetes; DVT: Deep Venous Thrombosis; CS: Cesarean Section; SAB: Spontaneous Abortion; DV: Domestic Violence; NRFHT: Non-Reassuring Fetal Heart Tracing; TAB: Therapeutic Abortion; VAVD: Vacuum-Assisted Vaginal Delivery

what I went through (Participant 3).

I don't want my problems to get any bigger than what they are right now. I'm taking it one day at a time and…not worrying about what I can't control. That helps me. That's the only thing I can do (Participant 4).

Second, the majority of interviews contained themes associated with positive outlook on pregnancy, rather than a negative outlook, although the latter was expressed in a minority of interviews.

You never know what can happen with you with the baby, but I don't believe that [bad things will happen during pregnancy] (Participant 2).

I'm OK because of my religious beliefs…I don't have to be scared (Participant 1).

It's my first baby, so I don't know how it feels when you deliver the baby and I'm kinda nervous and excited too (Participant 2).

Table 6: Proportion of interviews containing themes listed.	
	n = 10
Prior experiences	%
Reports significant challenges in life situation	40
History of poor experience in pregnancy or other medical experience highlighted	30
Response to Challenges	
Adapting by coping with challenges	100
Difficulty coping with challenges	20
Overall outlook on situation	
Identifies ways of caring for self	70
Positive outlook on pregnancy	60
Identifies self strengths	50
Reports significant anxiety, general or directed at pregnancy	50
Negative outlook on pregnancy	30
Resource management	
Appreciates support from medical staff	70
Identifies support in life	70
Self-efficacy	
Expresses ability to be able to do something	50
Pregnancy as a means of achieving this feeling (of being able to do something)	30

Everybody made it seem like it was going to be so difficult…I thought I was heading for the worst (Participant 9).

Every time I get pregnant I get really high blood pressure. It gets really, extremely bad…so me having kids is too bad (Participant 6).

In more than 70% of interviews, participants expressed ways of caring for themselves.

I have been eating healthier…because I don't want to have a heart attack. I want to be with my daughter (Participant 9).

I think I've like snapped back into life. I try to eat healthy, so I don't…gain excess weight that I don't need (Participant 7).

It's okay to cry or to let somebody else know that you don't know how to deal with it and you need help (Participant 1).

Additionally, while more than 70% of those interviewed identified a support person in their lives, they also looked to the health center as a major source of support during pregnancy.

It feels really good that I can run to my doctors or to my nurses and not be judged on whatever I'm feeling. If I'm feeling like, "oh I'm going to pull my hair out today!" to know that my doctors and my nurses, they won't judge me, but they'll help me cope with it, and they'll tell me other ways that I can deal with what I'm going through (Participant 1).

If something doesn't look right or something doesn't feel right I call you guys. And you tell me it's normal then I pretty much deal with it, but if it's something that I know that I need to come in, you guys see me (Participant 3).

You guys would say "everything is going to be fine" and "it looks good" and…that's what really helped (Participant 6).

It is notable, however, that there were some who did not identify support systems in their lives.

Housing wasn't stable…It was miserable. I had to keep moving around to different places because people didn't want me there (Participant 8).

I don't know what to do to deal with it, so a lot of times…I feel overwhelmed and stressed out because…I keep my feelings to myself and I try to deal with things myself (Participant 1).

I don't talk to anybody. I feel like there's no confidentiality…I don't want to waste anyone's time…I don't have any support and everything kinda went downhill (Participant 4).

Moreover 50% of the interviews expressed anxiety, either in general or specifically related to the pregnancy and possible outcomes.

If I have a child that has a mental disability or a physical disability, am I going to be able to handle it as a parent? Am I going to be nurturing (Participant 4)?

I'm just concerned that the way I'm feeling sometimes like not eating because I want to just go to sleep…and she's not being properly nurtured while I'm carrying her. That's my fear… [and I worry about this] almost every day (Participant 4).

When I started with the pregnancy, I went to the group thing, but when I went to do the ultrasound they found the baby had extra liquid in her lungs. So I got a little depressed and then I decided to just check by myself and I stopped going to the group (Participant 2).

Self-efficacy was another prominent theme in half of the interviews, and pregnancy was specifically viewed as a means of achieving self-efficacy for several of those interviewed.

I didn't think I could do it [pregnancy] at first, but I did it (Participant 8).

I am proud of myself and the things that I have accomplished throughout my life…which [includes] raising three children on my own (Participant 1).

I don't want to get out of bed [but when] I turn and look, and there is a picture of my son…I look at it for a couple of seconds and get up. And even though he fights with me every morning… he just inspires me to get up and just keep moving and pushing (Participant 4).

I feel like maybe, obviously, there's going to be challenges in the future, but I'm ready for it (Participant 9).

The numbers were too small to allow for correlation with resilience scores. Anecdotally, even women with lower resilience scores were able to identify personal strengths, had a positive outlook on pregnancy, and identified support systems within their lives, and some with high scores lacked support in their lives and experienced significant anxiety towards pregnancy.

DISCUSSION

Resilience scores increased from the prenatal to postnatal

period, but this was not a statistically significant finding. There were no obstetric factors or maternal characteristics associated with a change in resilience scores, except for the diagnosis of an STI during pregnancy, which resulted in a decrease in resilience. Social support and a positive outlook, prominent themes from the qualitative analysis, may be beneficial to adapting to pregnancy and even thriving in the face of adversity, although the themes identified could not be correlated with resilience scores due to small numbers.

To our knowledge, this is the first study to measure resilience before and after childbirth and to assess how pregnancy and childbirth may affect resilience scores. Most other studies of resilience in pregnancy have viewed resilience as a characteristic without taking into account its potential to change. For example, lower maternal resilience was associated with higher risk of preterm birth in one study [23], and higher resilience protected against depressive symptoms after preeclampsia in another [11]. Our understanding of resilience as a process is limited by cross-sectional assessments of resilience and future research should aim to assess processes of resilience.

Post-traumatic growth, a related concept, has been studied with respect to childbirth [9], such that factors associated with a potentially stressful delivery or higher levels of posttraumatic stress symptoms during pregnancy were associated with more growth. While post-traumatic growth is a similar concept to resilience, particularly when resilience is conceptualized as a process, the assessment of post-traumatic growth does not identify the individual or community resources that may modulate growth.

Resilience, on the other hand, as measured by the CD-RISC scale, does take these resources into account. Many of the participants had adverse antepartum, intrapartum, and postpartum events, and even though the overall resilience score did not significantly change during the two time periods, increased resilience was noted among individual participants. The fact that we were unable to demonstrate a change in resilience during the prenatal to postnatal period may reflect limitations of our study, rather than definitive evidence that resilience does not change as a result of pregnancy and childbirth. Since resilience may take time to change after a stressful event, measuring resilience in the early postnatal period (<12 weeks) may have limited our ability to detect changes that were still in process. Moreover, it is possible that our use of the CD-RISC scale limited our ability to view resilience as a process, a limitation acknowledged by the authors who created the scale at least when used cross-sectionally; nevertheless, in psychiatric populations, there has been observed changes in resilience, based on the scale, in response to therapy [21]. Our sample size could also have limited our ability to observe significant changes in resilience, although with the small differences observed, it is unlikely that a larger sample size alone would have identified any clinically significant change in resilience as a result of pregnancy.

Diagnosis of a STI during pregnancy was significantly associated with a change in resilience, although the observed change was small. This factor could be a marker for infidelity or social stress during the pregnancy, which could explain the observed change in resilience from an antenatal to postnatal time point. Future studies should further investigate diagnosis of STIs during pregnancy and the role health care providers may have in augmenting social support or resources, given the potential effect on resilience.

While the quantitative data did not demonstrate a statistically significant change in resilience as a result of maternal or obstetric factors, except for diagnosis of STI during pregnancy, the qualitative interviews did reveal several important themes to understand the role that resilience may play in pregnancy, or conversely how pregnancy may shape resilience. First, participants expressed overwhelmingly positive outlooks, despite numerous life challenges noted in the interviews. Personality factors, such as dispositional optimism, which are components of resilience, have also been linked with improved physical health [24,25], as well as improved birth outcomes [4]. Prior work has identified personal resources, such as self-esteem, mastery, and greater optimism as associated with higher birth weight [4]. While we were unable establish a relationship between a positive outlook (or lack of negative outlook) and resilience as measured by the CD-RISC scale, as a prominent theme in our qualitative data, the role of optimism deserves further study in larger cohorts and further consideration in pregnancy care.

Second, participants expressed self-efficacy, even in the context of anxiety related to the pregnancy. Pregnancy-related anxiety, more so than generalized anxiety or a history of depression, has been associated with preterm birth [26]. Perinatal distress, which encompasses a wide range of psychological phenomena relating to the episodic and chronic stress episodes that can encompass the peripartum time period, may also be an important mediator of birth outcomes [27]. While pregnancy may be a stressful time period, pregnancy can also represent an opportune time to build resilience, which was evidenced in the interview transcripts from this study. Prior work has shown that exposure to adversity and trauma improves resilience [28,29], and the experience of hardship and stress may actually help to augment self-efficacy. Post-traumatic growth following pregnancy has been described, as pregnancy is a life-changing event [30], but how perinatal factors mediate it is less clear. Future research should further investigate how the experience of pregnancy and childbirth influences self-efficacy, mediates perinatal distress, and can contribute to resilience.

Finally, medical staff was viewed as an important source of support, especially for women with less familial support. Pregnancy is a unique time in women's lives with greater access to medical care, as well as federal resources such as WIC. Over 75% of women were enrolled in WIC, a reflection of either the economic needs of the cohort, the resourcefulness of the women, or the assistance provided by the clinic to patients. The latter is especially relevant to consider, as it may be that identifying at risk women will help with preventing social isolation that can occur as women deal with difficult diagnoses or symptoms during pregnancy, themes evident in our interview transcripts. The role of healthcare providers was not directly assessed using the CD-RISC scale and the resilience scores did not appreciably change when stratified by number of antenatal visits or participation in group-based prenatal care; however, it is notable that multiple interviewees identified the support of healthcare providers in coping with the challenges of pregnancy.

CONCLUSION

Our study demonstrates that overall resilience does not change as a result of pregnancy, although larger studies are needed to confirm these results. Our qualitative data highlight the challenges women face during their pregnancies, including dealing with financial challenges, adverse events, or coping with uncertainty related to the unknown outcomes of pregnancies. Further research is needed to identify intervention points during prenatal and postnatal care, especially in chronically stressed populations, and to correlate resilience scores with perinatal and maternal outcomes, in order to further augment the support provided to women during pregnancy and childbirth.

Strengths

This study was prospective, and thus allowed for evaluation of resilience, as measured by the CD-RISC scale, at two time periods. It explored how resilience may potentially change as the result of stress related to pregnancy and delivery. It employed mixed methods, with the qualitative data allowing further exploration for observations made from the quantitative data.

Limitations

While we were able to evaluate resilience in the prenatal and postnatal periods, we are unable to make strong conclusions about the process of resilience using the CD-RISC scale. CD-RISC scale was designed to assess resilience factors, but not the process of resilience. While we hoped to investigate the process of resilience by measuring resilience at two time points, we were unable to demonstrate a difference. Resilience may have been measured too early in the postnatal period to detect a change in resilience, or our sample size may have been too small given subtle changes noted. Nevertheless, our study represents one-third of the clinic's population during the study period and serves as a basis to plan future studies.

While the qualitative data identified several factors that helped women during the prenatal and postnatal transitions, we were unable to effectively link resilience scores with the qualitative data, other than in an anecdotal manner. Furthermore, the qualitative data were derived from a subsample and the views and opinions expressed may not be representative of the broader population. The interviewer was known to patients and could also have biased results. The views expressed in this paper nevertheless highlight important areas to further explore, such as the role of support systems, positive outlook on pregnancy, and how pregnancy may impact self efficacy.

In conclusion, we did not find an appreciable change in resilience scores overall, however, we did observe individual changes in resilience scores. Future studies should explore resilience scores at different time points in the postnatal time period and further account for the role of social support and self-efficacy in mediating resilience.

ACKNOWLEDGEMENTS

We are grateful to the participants for their time and contributions to the study. We would like to acknowledge the support of the staff at The Dimock Center. Data analysis was supported by Harvard Catalyst | The Harvard Clinical and Translational Science Center (National Institutes of Health Award 8UL1TR000170-05 and financial contributions from Harvard University and affiliated academic health centers). The Massachusetts League of Community Health Centers Special Projects Grant provided funding for the study.

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Cite this article

Johnson KM, Paley FM, Modest AM, Hacker MR, Shaughnessy S, et al. (2017) The Impact of Pregnancy on Resilience in Women Seeking Obstetric Care at an Urban Community Health Center. Ann Pregnancy Care 1(1): 1004.