UWHR 2020

THE UTAH WOMEN'S HEALTH REVIEW

The Center of Excellence in Women's Health
UNIVERSITY OF UTAH

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Letter from the Editor

I am excited to introduce the 2020 issue of the Utah Women's Health Review (UWHR), which was newly launched by the University of Utah Center of Excellence in Women's Health and Spencer S. Eccles Health Sciences Library in May of 2020. Despite coming on board just as COVID-19 was ramping up in the US, we have had a successful past year. In May of 2020, we had a well-attended Sex, Gender, and Women's Health Across the Lifespan symposium, featuring Dr. Susan Madsen updating us on the education, leadership, and well-being of Utah women; Dr. Lisa Diamond challenging us on new ways of thinking of sex, gender, transgender, and non-binary identities; Dr. Annie Fukushima painting the stark picture of gender-based violence across borders, and Dr. Marjorie Jenkins educating us on evidence-based clinical care for midlife women. And throughout the year, on a rolling basis, we published a variety of manuscripts and commentaries, several of which have been PubMed indexed due to being affiliated with NIH grants.

Our 2021 issue is well underway with an increasing number of submissions and publications. The journal publishes original research or review articles, data snapshots, and commentaries focusing on women's health or sex and gender differences that affect the 7 Domains of Health—physical, social, emotional, intellectual, environmental, financial, and spiritual. The Editorial Board reflects our ONE U for U (1U4U) approach to sex and gender health. By creating and hosting this peer-reviewed journal within Eccles Library Digital Publishing, UWHR is able to facilitate publication opportunities to established sex and gender health researchers as well as graduate students, residents, and up-and-coming professionals all over Utah. UWHR's rolling submissions and publication dates allow for a fast turn-around time as well as a satisfying experience for submitting authors. Using the WordPress platform, we invite ongoing submissions. There are no publication charges. All published articles are covered by a Creative Commons License (CC BY-NC-ND 4.0) and assigned a DOI. UWHR could not succeed without our valuable peer reviewers and associated editors. Please reach out to us if you are interested in serving in either of these capacities.

The broad spectrum of articles you will find in this 2020 issue highlight the reality that health is more than one dimension. Thinking of health in these multiple dimensions more accurately portrays women's health challenges and embraces creative problem solving for improving women's health across the lifespan. We look forward to receiving and reviewing your submissions this next year and beyond.

Sincerely,

Karen Schliep, PhD, MSPH
Editor-in-Chief

Sex, Gender, and Women's Health Across the Lifespan
Virtual Symposium 2020

Visit the virtual symposium at https://uwhr.utah.edu/virtual-symposium/ for video presentations (captioned), Q&A, abstracts, and posters.

The Status of Women in Utah: Education, Leadership & Well-Being	Susan Madsen, PhD, Utah Valley University
Exploring Genetic Variation in Normal & Diseased Human Placentas	Nathan Blue, MD, University of Utah
Progesterone, Post-partum Women and Preventing Methamphetamine Use: Applying Maternal-Fetal Medicine's Favorite Medicine to Perinatal Substance Abuse	Marcela Smid, MD, University of Utah
Modeling Protection through Preeclampsia	Leah Owen, MD, PhD, University of Utah
The Role of Gender in the Diagnosis and Treatment of Complex Disorders	Laura Pace, MD, PhD, University of Utah
New Thinking on Sex, Gender, Transgender and Non-Binary Identities	Lisa Diamond, PhD, University of Utah
Sex Differences in Subjective Cognitive Decline: Findings from BRFSS (2015–2018)	Karen Schliep, PhD, University of Utah
Increasing Afghan-American Women's Awareness of Cervical Cancer Prevention	Nabilah Safi, BSN, University of Utah
Therapeutics Targeting Brain Bioenergetics may be Effective as Antidepressants in Altitude-related Treatment-Resistant Depression: Sex-based Animal Model Studies	Shami Kanekar, PhD, University of Utah
Assessing Residents' Adolescent Sexual and Reproductive Health Knowledge, Confidence, and Self-Efficacy: A Novel Simulated Patient Workshop	Jennifer Kaiser, MD, University of Utah Alyson Shinn, DO, University of Utah Ocean Candler, BS, PPAU
Witnessing Gender-Based Violence Across Borders	Annie Fukushima, PhD, University of Utah
Evidence-Based Clinical Care for Midlife Women: What do Research and Clinical Guidelines Tell us?	Marjorie Jenkins, MD, University of South Carolina

The Association Between Preconception Body Mass Index and Subfertility Among Hispanic and non-Hispanic Women: A Cross-Sectional Study from Utah's Pregnancy Risk Assessment Monitoring System Survey (2012–2015)

Qingqing Hu, Jihyun Lee, Jeannette Nelson, Marci Harris, Rebekah H. Ess, Charles R. Rogers, Jessica Sanders, James VanDerslice, Joseph Stanford, & Karen Schliep

/ University of Utah

Abstract

Objective: To investigate the association between pre-pregnancy body mass index (BMI) and subfertility within a population-based cohort, exploring Hispanic ethnicity as a potential effect modifier.

Methods: We used cross-sectional study data from the Utah Pregnancy Risk Assessment Monitoring System from 2012–2015. Relationships between maternal pre-pregnancy BMI and subfertility were evaluated via Poisson regression models with robust error variance, accounting for the stratified survey sampling. Preconception BMI was analyzed continuously and categorically. Women's subfertility was defined via self-report in two ways: 1) time trying to achieve pregnancy; and 2) report of using fertility-related drugs/medical procedures.

Results: The median age was 27.0; 18.8% were obese, and 15.9% were Hispanic. Women with preconception obesity (BMI>30kg/m^2), compared to normal weight women (18.4kg/ m^2<BMI<25kg/m^2) had a 1.85 (95% CI 1.43, 2.38) higher adjusted prevalence ratio (aPR) for having subfertility defined by time trying and a 1.73 (95% CI 1.20, 2.32) higher aPR for receiving fertility-enhancing drugs/medical procedures. Continuous models indicated a linear relationship between BMI and subfertility (aPR 1.04, 95% CI 1.03, 1.06 for time trying; and 1.06, 95% CI 1.03, 1.10 for receiving fertility-enhancing drugs/medical procedures).

Conclusions: Obese women, but not underweight or overweight women, reported higher subfertility than normal-weight women. Findings among this cohort of at-risk new mothers, oversampled on low education and birth weight and comprised of higher than the national average of Hispanics, indicated a dose-response relationship between obesity and subfertility.

Implications: Our findings highlight the importance of population-oriented obesity prevention for at-risk women with intentions to conceive.

Introduction

Body mass index (BMI) in the U.S. has continued to rise over the last two decades, women of reproductive age included. The 2015–2016 National Health and Nutrition Examination Survey estimated that among women ages 20 to 39 years, 36.5% were obese (BMI >30 kg/m^2).[1] The association between women's obesity and subfertility has been established,2 however, existing studies focus on the link between maternal pre-pregnancy BMI and pregnancy outcomes among non-Hispanic white women undergoing fertility treatment.[2] Prior studies have been conducted among Asians and African Americans,[3,4] but few among Hispanic women.[5,6] As the proportion of women with obesity in the U.S. continues to rise, evaluating how BMI and obesity directly impact women of various race/ethnicities is critical to address health-related disparities among under-represented women.

The Hispanic population is of interest for several reasons. Although overall fertility rates in the U.S. decreased from 2007–2017, Hispanics had the largest decline compared to non-Hispanic whites and African Americans.[7] Furthermore, maternal pre-pregnancy BMI distribution by race indicates that Hispanics have the largest percent of overweight mothers (29.7%) compared to non-Hispanic white (24.1%)

African-American (26.9%), American Indian/Alaskan Native (27.2%), or Asian (19.9%) mothers.1 Lastly, although Hispanic women make up 12.5% of the U.S., Hispanics only use 5.4% of the nation's infertility care/resources—potentially resulting from the disparities in access to care.[8] A better understanding of the factors that contribute to this health disparity are needed, warranting research that includes women of Hispanic ethnicity and explores unique attributes that may influence access to infertility care.

Taking into account potential effect modification by Hispanic ethnicity, our study aimed to investigate the association between pre-pregnancy BMI and women's subfertility within a population-based cohort of Utah women, comprised of roughly 16% Hispanics.

Methods

Study Design:
This is a cross-sectional study using data from the Utah Pregnancy Risk Assessment Monitoring System (PRAMS) survey, which has the standardized data collection methodology developed by the Centers for Disease Control and Prevention (CDC).

Data Sources:
Started by the CDC in 1987, the current study's population stems from the PRAMS nationwide surveillance project, which has the two-fold purpose of decreasing the morbidity and mortality of mothers and infants, and improving their health by reducing adverse outcomes.[9] PRAMS is a population-based and state-specific study of women who delivered a live birth, accompanied by their maternal attitudes, behaviors, and experiences before, during, and shortly after pregnancy. The health topics covered in PRAMS are related to the following: prenatal care, attitudes and feelings about previous pregnancy, health insurance coverage, cigarette smoking, drinking, physical abuse, maternal stress, economic status, and infant health status. One key aspect of PRAMS is the stratified systematic sampling, which oversamples on features related to high risk women (e.g., mothers of low-birth-weight infants, those living in high-risk geographic areas, and racial/ethnic minority groups). The design and methodology of PRAMS have been published elsewhere.[10]

For the current study, the authors used data from the Utah PRAMS Phase 7 (2012–2015) questionnaire (n = 5,770 reflecting an estimated population of 199,905 women [number of women in the population that each respondent represents]). PRAMS Phase 7 Utah sampling was stratified by maternal education and infant birthweight. The design and sampling frame of PRAMS assure a study sample that is representative of Utah's population–including a 16% prevalence of Hispanic ethnicity.[10]

Approximately 200 new mothers are randomly selected from Utah birth certificate data each month to participate in PRAMS. New mothers are contacted via mailed questionnaire (available in English and Spanish) multiple times and telephone follow-up. Response rates in Utah were roughly 72% in 2012, 66% in 2013, 69% in 2014, and 67% in 2015, higher than the 60% response rate that the CDC expects.[9] Participating womens' responses are linked to extracted birth certificate data items for analysis. The availability of birth certificate information for all births is the basis for drawing stratified samples and, ultimately, for generalizing results to the state's entire population of births.[9] The PRAMs weighting process produces an analysis weight taking into account the stratified sampling along with nonresponse and noncoverage components.[9] The analysis weight of the PRAMs data can be interpreted as the number of women like herself in the population that each respondent represents.[9]

The study was evaluated by the University of Utah Institutional Review Board (IRB) and determined exempt.

Outcome Measures:
The primary outcome of interest was women's subfertility which was assessed in two ways. First, subfertility was defined based on self-reported time trying to achieve pregnancy: >12 months for women ≤35 years of age, and >6 months for women > 35 years.[11] In the Utah PRAMS Phase 7 (2012–2015) questionnaire, time trying was assessed by two questions: "When you got pregnant with your new baby, were you trying to get pregnant?" and if women answered "yes" they were then asked "How many months were you trying to get pregnant?" with potential responses of 0–3 months, 4–6 months, 7–12 months, 13–24 months, or >24 months. Second, we defined subfertility based on self-reported fertility treatment. If women answered yes they were trying to get pregnant with their new baby, then they were also asked "Did you take any

fertility drugs or receive any medical procedures from a doctor, nurse, or other health care worker to help you get pregnant with your new baby?" with potential responses of fertility-enhancing drugs prescribed by a doctor, artificial insemination, assisted reproductive technology, other medical treatment, or "I wasn't using fertility treatments during the month that I got pregnant with my new baby."

Exposure Measures:
Pre-pregnancy BMI was calculated using birth certificate reported height and weight, and categorized in standard groups for underweight (<18.5 kg/m^2); normal (18.5-24.9 kg/m^2); overweight (25.0-29.9 kg/m^2); and obese (30 kg/m^2 or higher).[5] Height and weight data were also available via self-report from the PRAMS questionnaire. Given the high correlation of BMI data from both sources (Pearson correlation coefficient=93.5%), missing birth certificate BMI values (n=71) were replaced with PRAMS BMI data.

Covariates:
Confounding factors thought to impact both women's preconception BMI and subfertility were determined based on prior literature. Demographic and health factors included race/ethnicity, maternal education, marital status, family income, health insurance, prior pregnancy/live birth, and preconception maternal age, smoking, drinking, diabetes, hypertension, and depression were all considered potential confounding factors.[2-6]

Statistical Analysis:
Participant characteristics were reported across BMI categories while taking into account the complex survey design of PRAMS.[9] The continuous variables (e.g. maternal age, BMI) were reported by median and interquartile range (IQR), and the categorical variables were reported by frequencies and percentages. To evaluate associations between preconception BMI and women's subfertility, modified Poisson regression models were employed with robust error variance, accounting for the stratified sampling, to estimate prevalence ratios (PR) and 95% confidence intervals (CI), with normal weight as the referent group.[12] Additionally, adjusted multinomial logistic regression was used to analyze the association between BMI and multiple categories of months trying to get pregnant (0–3 months, 4–6 months, 7–12 months, 13–24 months, or >24 months). Effect modification by Hispanic ethnicity was evaluated via stratified analyses and tested via the interaction term approach. SAS 9.4 and Stata 15 were used for the analysis.

Results

After excluding the 20 missing values for BMI and 107 missing values for whether women were trying to get pregnant with their new baby, 5,644 women (98.2%) were included in the analyses, reflecting an estimated population size of 196,323 women (Figure 1).

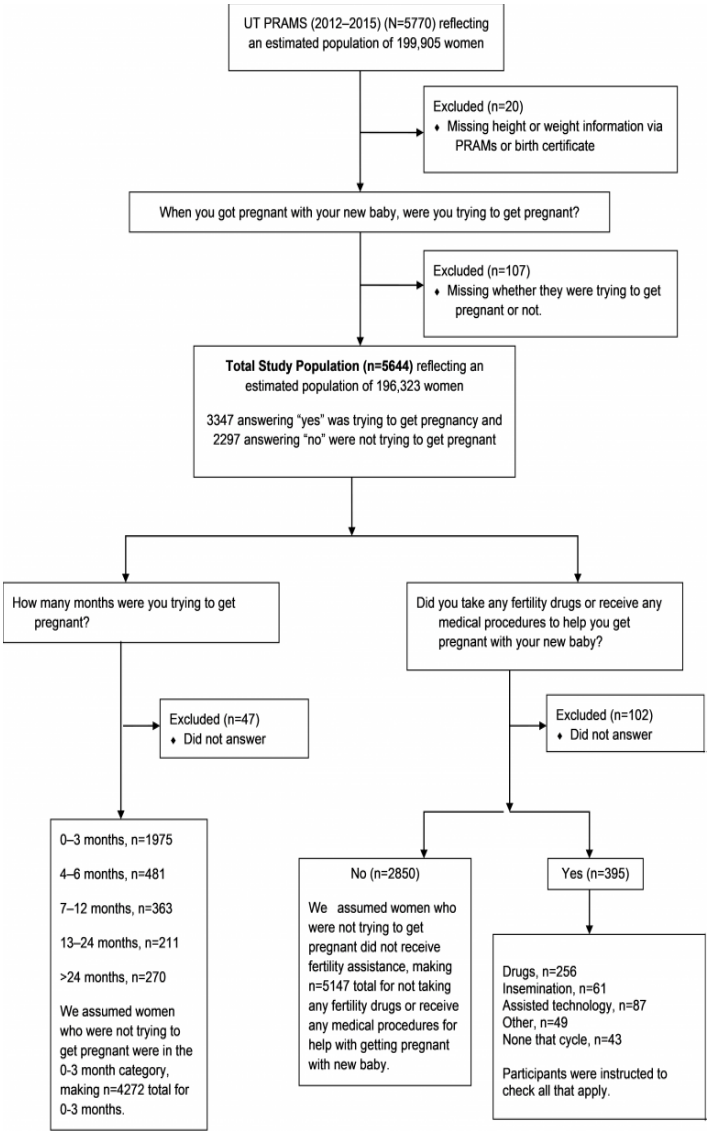

Figure 1. Study Participant Flowchart: Utah PRAMS, 2012–2015

Characteristics of the Mothers:
Median BMI of the study population was 23.8 (interquartile range [IQR] 21.1, 28.3) (kg/m^2), with BMI categories of underweight (4.7%), normal weight (54.3%), overweight (22.3%), and obese (18.8%) (Table 1). Median age was 27.0 (IQR 24.0, 31.0) years old. The

majority of women were parous (67.1%), had health insurance (82.1%), were married (83.2%) and had ≥ 12 years of education (90.3%). Most of the women (84.1%) were White non-Hispanic, while 9.2% were Non-white Hispanic and 6.7% were White Hispanic. Prior to pregnancy, nearly a third of women (30.8%) reported consuming alcohol and 11.2% smoked tobacco. Preconception prevalence of depression, diabetes, and hypertension were 10.1%, 1.3%, and 2.2%, respectively.

Compared to women of normal weight, obese women were more likely to be older, parous, of Hispanic ethnicity, have no health insurance, of lower education and family income, and report smoking or drinking alcohol in the two years prior to pregnancy. Moreover, obese women were more likely to have been previously diagnosed with diabetes, hypertension, or depression.

Table 1: Demographic, lifestyle and clinical characteristics of women by BMI, Utah PRAMS, 2012–2015, n=5644, reflecting an estimated population size of 196,323 women.

Characteristics	Total	Under-weight (4.7%)	Normal weight (54.3%)	Over-weight (22.2%)	Obese (18.8%)
BMI (kg/m²); median (IQR)	23.8 (21.1, 28.3)	17.8 (17.2, 18.2)	21.8 (20.5, 23.2)	27.3 (25.8, 28.3)	34.4 (31.9, 38.6)
Maternal age (years) median (IQR)	27.0 (24.0, 31.0)	25.6 (22.1, 29.5)	27.1 (23.7, 30.7)	27.5 (24.0, 32.0)	28.4 (24.5, 32.3)
16–25	33.1	45.2	34.2	31.9	28.2
26–35	57.6	48.9	57.7	58.1	59.0
36–46	9.3	5.9	8.0	10.0	12.8
Race/ethnicity					
Hispanic, non-white	9.2	8.9	7.6	12.9	9.5
Hispanic, white	6.7	2.4	5.4	9.0	8.7
Non-Hispanic, white	84.1	88.7	87.0	78.1	81.7
Maternal education (years)					
0–8	1.7	0.7	1.1	2.7	2.2
9–11	8.0	8.7	6.6	10.0	9.7
12	19.2	19.6	16.3	20.5	25.7
13–15	35.7	30.3	34.8	36.6	38.7
16+	35.4	40.7	41.2	30.2	23.6
Married	83.2	78.8	85.6	81.1	79.8
Family income					
$0–$22,000	25.5	34.8	22.6	29.0	27.6
$22,001–$44,000	25.9	26.1	23.3	27.5	31.6
$44,001–$67,000	21.0	14.6	21.7	20.0	21.1
$67,001+	27.6	24.5	32.4	23.5	19.6
Health Insurance	82.1	77.0	85.1	77.8	79.6
Smoking [a]	11.2	12.8	8.8	11.9	16.8
Drinking [a]	30.8	25.6	27.8	33.0	37.6
Diabetes [b]	1.3	1.8	0.7	1.5	2.6
Hypertension [b]	2.2	2.2	1.0	2.8	5.0
Depression [b]	10.1	12.4	7.2	12.0	16.0
Previous live birth	67.1	66.7	65.3	68.2	70.9

Weighted percentages unless otherwise specified. Pre-pregnancy BMI was calculated using birth certificate reported height and weight, and categorized in standard groups for underweight (<18.5 kg/m2); normal (18.5-24.9 kg/m2); overweight (25.0-29.9 kg/m2); and obese (30 kg/m2 or higher).
[a] Smoking and drinking up to 2 years before pregnancy;
[b] Diabetes, hypertension and depression diagnoses prior to pregnancy.

Table 1: Demographic, lifestyle and clinical characteristics of women by BMI, Utah PRAMS, 2012–2015, n=5644, reflecting an estimated population size of 196,323 women.

Association Between BMI and Subfertility Measures:

Among women who were trying to get pregnant with their most recent baby, each unit increase in BMI was associated with a higher adjusted prevalence ratio (aPR) of months trying to get pregnant: 1.03 (95% CI 1.01, 1.05) for 4–6 months, 1.03 (95% CI 1.01, 1.05) for 7–12 months, 1.06 (95% CI 1.04, 1.09) for 13–24 months, and 1.08 (95% CI 1.06, 1.10) for >24 months compared to women who attempted to achieve pregnancy for 0–3 months (Table 2). Obese women were 1.58 times (95%CI 1.22, 2.06), 1.39 times (95% CI 1.03, 1.89), 1.92 times (95% CI 1.36, 2.70), and 3.31 times (95% CI 2.43, 4.50) as likely to have tried 4–6, 7–12, 13–24, and >24 months to get pregnant, respectively, compared to women who had tried 0–3 months.

Table 2: Unadjusted association between BMI and self-reported months trying to get pregnant.

BMI	Months trying to get pregnant				
	0–3 months	4–6 months	7–12 months	13–24 months	>24 months
	PR (95% CI)				
Continuous BMI	1.00	1.03 (1.01, 1.05)	1.03 (1.01, 1.05)	1.06 (1.04, 1.08)	1.08 (1.06, 1.10)
Categorical BMI					
Underweight	1.00	1.00 (0.60, 1.60)	0.93 (0.54, 1.61)	0.19 (0.05, 0.79)	0.82 (0.39, 1.73)
Normal weight	1.00	1.00	1.00	1.00	1.00
Overweight	1.00	1.14 (0.88, 1.47)	1.34 (1.02, 1.76)	0.99 (0.68, 1.43)	1.62 (1.16, 2.25)
Obese	1.00	1.58 (1.22, 2.06)	1.39 (1.03, 1.89)	1.92 (1.36, 2.70)	3.31 (2.43, 4.50)

Pre-pregnancy BMI was calculated using birth certificate reported height and weight, and categorized in standard groups for underweight (<18.5 kg/m²); normal (18.5-24.9 kg/m²); overweight (25.0-29.9 kg/m²); and obese (30 kg/m² or higher).

Table 2: Unadjusted association between BMI and self-reported months trying to get pregnant.

After adjusting for maternal age, income, education, marital status, and race/ethnicity, women with preconception obesity, compared to normal weight women, had a 1.85 (95% CI 1.43, 2.38) higher aPR for having subfertility defined by time trying (Table 3). Continuous models indicated a linear relationship between BMI and subfertility (aPR: 1.04, 95% CI 1.03, 1.06); however, no association was found between underweight (aPR: 0.50, 95% CI 0.22, 1.14) or overweight (aPR: 1.06, 95% CI 0.80, 1.41) status and subfertility compared to normal weight. Similar findings were found for receiving any fertility-related drugs, insemination or in vitro fertilization [IVF]) with obese women having a 73% higher prevalence (95% CI 1.29, 2.32) of these procedures compared to normal weight women. Further adjustment for parity and preconception smoking, alcohol consumption, and depression in all models did not appreciably alter the findings (Table 3), nor did further adjustment for a prior diabetes or hypertension diagnosis. As exemplified in the stratified analyses (Table 4), no effect modification by Hispanic ethnicity was identified by the interaction test (Wald test F-value; P=0.73).

Table 3: Relationship between BMI and months trying to get pregnant or fertility treatment.

	Subfertility defined by months trying to get pregnant >12 versus ≤ 12 months for women ≤35 and >6 versus ≤ 6 months for women >35		
	Unadjusted	Model 1[a]	Model 2[b]
	PR (95% CI)	aPR (95% CI)	aPR (95% CI)
BMI Continuous	1.04 (1.03, 1.05)	1.04 (1.03, 1.06)	1.04 (1.03, 1.06)
BMI Category			
Underweight	0.53 (0.25, 1.11)	0.50 (0.22, 1.14)	0.57 (0.24, 1.34)
Normal weight	1.00	1.00	1.00
Overweight	1.03 (0.78, 1.35)	1.06 (0.80, 1.41)	0.97 (0.76, 1.39)
Obese	1.81 (1.43, 2.30)	1.85 (1.43, 2.38)	1.69 (1.33, 2.29)
	Receiving any fertility-related drugs or medical procedures		
	Unadjusted	Model 1[a]	Model 2[b]
	PR (95% CI)	aPR (95% CI)	aPR (95% CI)
BMI Continuous	1.04 (1.02, 1.08)	1.06 (1.03, 1.10)	1.06 (1.03, 1.10)
BMI Category			
Underweight	0.70 (0.35, 1.42)	0.92 (0.46, 1.84)	1.02 (0.41, 2.01)
Normal weight	1.00	1.00	1.00
Overweight	1.00 (0.73, 1.36)	1.08 (0.78, 1.49)	1.07 (0.77, 1.47)
Obese	1.43 (1.08, 1.91)	1.73 (1.29, 2.32)	1.64 (1.23, 2.20)
	Receiving infertility enhancing drugs only		
	Unadjusted	Model 1[a]	Model 2[b]
	PR (95% CI)	aPR (95% CI)	aPR (95% CI)
BMI Continuous	1.03 (1.01, 1.05)	1.05 (1.02, 1.07)	1.04 (1.02, 1.07)
BMI Category			
Underweight	0.62 (0.24, 1.63)	0.83 (0.31, 2.23)	0.91 (0.34, 2.42)
Normal weight	1.00	1.00	1.00
Overweight	0.84 (0.56, 1.27)	0.92 (0.59, 1.43)	0.90 (0.58, 1.39)
Obese	1.47 (1.04, 2.09)	1.81 (1.25, 2.60)	1.71 (1.20, 2.45)

[a]Model 1 was adjusted by maternal age, race/ethnicity, education, marital status, and family income.

[b]Model 2 was further adjusted by preconception smoking, drinking, depression and previous live birth. Modified Poisson regression models with robust error variance, taking into account stratified survey sampling were used to calculate PRs and 95% CIs.

Pre-pregnancy BMI was calculated using birth certificate reported height and weight, and categorized in standard groups for underweight (<18.5 kg/m2); normal (18.5-24.9 kg/m2); overweight (25.0-29.9 kg/m2); and obese (30 kg/m2 or higher).

Table 3: Relationship between BMI and months trying to get pregnant or fertility treatment.

Table 4: Relationship between BMI and months trying to get pregnant, stratified by Hispanic ethnicity.

Non-Hispanic	**Subfertility defined by months trying to get pregnant** >12 versus ≤ 12 months for women ≤35 and >6 versus ≤ 6 months for women >35		
	Unadjusted	Model 1[a]	Model 2[b]
	PR (95% CI)	aPR (95% CI)	aPR (95% CI)
BMI Continuous	1.04 (1.03, 1.06)	1.04 (1.03, 1.06)	1.04 (1.03, 1.06)
BMI Category			
Underweight	0.54 (0.25, 1.17)	0.52 (0.22, 1.21)	0.60 (0.26, 1.39)
Normal weight	1.00	1.00	1.00
Overweight	1.10 (0.82, 1.47)	1.10 (0.81, 1.49)	1.09 (0.81, 1.48)
Obese	1.84 (1.43, 2.36)	1.81 (1.38, 2.36)	1.76 (1.35, 2.29)
Hispanic	**Subfertility defined by months trying to get pregnant** >12 versus ≤ 12 months for women ≤35 and >6 versus ≤ 6 months for women >35		
	Unadjusted	Model 1[a]	Model 2[b]
	PR (95% CI)	aPR (95% CI)	aPR (95% CI)
BMI Continuous	1.05 (1.01, 1.09)	1.05 (1.00, 1.09)	1.04 (0.99, 1.09)
BMI Category			
Underweight	0.35 (0.32, 1.89)	0.35 (0.05, 2.61)	0.29 (0.04, 2.32)
Normal weight	1.00	1.00	1.00
Overweight	0.93 (0.49, 1.77)	0.78 (0.40, 1.52)	0.72 (0.37, 1.39)
Obese	2.05 (1.02, 4.11)	1.99 (0.94, 4.20)	2.11 (1.01, 4.43)

Table 4: Relationship between BMI and months trying to get pregnant, stratified by Hispanic ethnicity.

[a]Model 1 was adjusted by maternal age, education, martial status, and family income.

[b]Model 2 was further adjusted by preconception smoking, drinking, depression, and previous live birth. Modified Poisson regression models with robust error variance, taking into account stratified survey sampling were used to calculate PRs and 95% CIs. Pre-pregnancy BMI was calculated using birth certificate reported height and weight, and categorized in standard groups for underweight (<18.5 kg/m^2); normal (18.5-24.9 kg/m^2); overweight (25.0-29.9 kg/m^2); and obese (30 kg/m^2 or higher).

Discussion

Our research among a population-based cohort of women found that obese women, compared to normal weight women, have a 73% and 85% higher probability of experiencing a longer time to pregnancy or using fertility treatment after controlling for a number of sociodemographic and lifestyle factors. No association was found between underweight or overweight women and subfertility; nor was effect modification by Hispanic ethnicity found.

Strengths of the Study:
A population-based sample was used and weighted to represent all mothers who gave birth in Utah from 2012–2015. Further, our sample size included a representative proportion of Hispanic ethnicity, and ensured that at-risk women were included. Additionally, the PRAMS questionnaire included detailed information about socio-demographics, reproductive and health history, and lifestyle characteristics, therefore we were able to assess multiple confounding factors that may affect adiposity and subfertility. Finally, subfertility was measured through different ways (time trying and fertility-related drugs/medical procedures).

Limitations of the Data:
First, the PRAMS questionnaire collects self-reported data from women who just delivered live births. The reliability of self-reported preconception height, weight, and months trying to get pregnant is dependent on women's ability to accurately recall, which has been shown to be prone to error.[13,14] Second, BMI may not be the best measure to assess women's obesity because it does not account for ethnicity, age, body composition and shape, or healthy body mass such as muscle.[3] The measurements of waist circumstance or waist-hip ratio for central adiposity would be helpful.[15] Third, we could not account for BMI of male partners, which might influence the results.[16] Fourth, selection bias cannot be ruled out. PRAMS follows a strict protocol for sampling mothers, but Utah's average response rate for 2012–2015 was 69%. Fifth, certain reproductive disorders such as polycystic ovary syndrome (PCOS) may confound the relationship between BMI and subfertility, but such information was not available in the UT-PRAMS Phase 7 questionnaire. PCOS information has been added to the UT-PRAMS Phase 8 questionnaire (2016 to present) and thus, further research taking into account PCOS diagnosis and/or symptomology is warranted. Finally, perhaps most importantly, this study included only women who had a live birth; the results may differ if women who want to conceive but have not done so successfully yet were included.[17]

Interpretation:
The finding of a relationship between obesity and subfertility agrees with an extensive body of previous literature.[2,3,18-34] For instance, Brewer and Balen concluded that obesity impaired both natural and assisted conception, especially in women with a BMI >35 kg/m^2.[19] Gaskins et al. found that being overweight or obese in female adulthood was associated with modest reductions in fecundity that led to an increase in duration of pregnancy attempt.[2] However, the results from our study differ from other studies in that we did not find that preconception overweight (not obese) women and subfertility are associated.[2,15,21,24] Conflicting findings may be attributable in part to the fact that prior studies mostly examined women being treated for subfertility.[2,21,24] Future studies among non-clinical populations are needed to clarify the relationship between adiposity and subfertility among women not seeking treatment.

Additionally, our findings are consistent with other research conducted in Utah,[16] which may be reflective of the relatively good health of the Utah population compared to other states.[25] We found no differences in the association of BMI with subfertility among Hispanic women compared to non-Hispanic women. This was most likely due to the relatively small sample size of Hispanic women in our dataset, thus we may have a limited power to detect the disparities between Hispanic and NHW women. However, similarly, Wise and colleagues did not find an association between overweight (BMI of 25.0-29.9 kg/m^2) and reduced fecundity among African American women, but did find an association between class 2 and 3 obesity (BMI of ≥ 35.0kg/m^2) and reduced fecundity.[4] Whether there are clear differences in the effects of adiposity on subfertility among different race and ethnicities has yet to be elucidated. Further population-based research that includes adequate representation of women from various races and ethnicities is warranted before conclusions can be made.

Fertility treatment utilization within our sample was similar to that found in other representative samples.

Among our sample of women who reported having sought out fertility treatment, 62.1% reported taking fertility drugs to help them get pregnant while 13.4% reported receiving artificial insemination. A National Survey of Family Growth (NSFG) study reported that nearly half of the women who were trying to get pregnant received drugs to improve ovulation, followed by 13.1% for artificial insemination.[26] Because of the small sample sizes for Hispanic women receiving different types of fertility treatment, we were limited in our ability to report the disparities between Hispanic and non-Hispanic women in use of the various fertility treatments. While access to infertility treatment is beyond the scope of this study, given prior research showing that socioeconomic status is significantly associated with the ability to seek out fertility treatment in the US,[27] increased equity in access to fertility diagnostics and treatment is needed.[28]

Health Implications:
In brief, this population-based PRAMS study inclusive of at-risk mothers found that preconception obesity, but not overweight or underweight, was associated with women's subfertility, consistent with prior research. There was no difference by Hispanic ethnicity nor when evaluating subfertility in multiple ways. Given inconsistent findings to date, we are wary to make recommendations for clinicians or policy makers based on our findings. Further population-based research adequately including women and couples of various races and ethnicities is needed to help better understand whether healthy women who are overweight, but not obese, are comparable to normal weight women in regards to ability to achieve a pregnancy. This research is important given that women deserve to have preconception counsel in regards to risk factors for subfertility based not on intuition but rather findings from sound and methodologically rigorous research.

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Author Contributions:

Concept and design: Dr. Karen C. Schliepand Qingqing Hu

Data analysis: Qingqing Hu, Jihyun Lee, Jeannette Nelson, Marci Harris, Rebekah H. Ess

Drafting of Manuscript: Qingqing Hu, Jihyun Lee

Critical revision of the manuscript: Drs. Charles R. Rogers, Jessica Sanders, James VanDerslice, and Joseph B. Stanford

Final approval: Dr. Karen C. Schliep

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None reported

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The Baby-Friendly Hospital Initiative (BFHI): An Early Cross-Sectional Analysis of PRAMS Phase 8 Data on Hospital Practices and Breastfeeding Outcomes in Utah and Wyoming

Jesse Bliss, Nana Akofua Mensah, Charles R. Rogers, Joseph Stanford, James VanDerslice, & Karen Schliep
/ University of Utah

Abstract

Objective: Breastfeeding has immediate and long-term benefits for both maternal and child health. This study examines the association between Baby-Friendly Hospital Initiative (BFHI) experiences and breastfeeding outcomes in the Mountain West region.

Methods: A cross-sectional (retrospective secondary data analysis) was performed using the 2016 Pregnancy Risk Assessment Monitoring System (PRAMS) data. The participants were derived from a stratified random sample of 2,013 women living in Utah and Wyoming who recently had a live birth and who were surveyed on BFHI practices. The association between BFHI experiences and breastfeeding duration were assessed using crude and adjusted Poisson regression models, controlling for other BHFI experiences and maternal age, pre-pregnancy BMI, household income, smoking, alcohol, delivery method, and number of days spent in the hospital post delivery.

Results: 82.4% and 82.3% of women from Utah and Wyoming, respectively, reported breastfeeding for 2 months or longer. After controlling for other BFHI experiences and potential confounders, the one shared BFHI experience that was associated with breastfeeding for 2 months or longer vs less than 2 months was starting breastfeeding in the hospital (adjusted prevalence ratio [aPR]=1.49, 95% CI (1.12, 1.98) in Utah and aPR=2.03, 95% CI (1.13, 3.64) in Wyoming. Among women in Utah and Wyoming, only 5 of 7 BFHI steps were significant for breastfeeding duration in at least one state.

Conclusions: There is substantial epidemiological support for health benefits to both mother and infant for exclusive breastfeeding to 6 months and prolonged breastfeeding until at least 1-year. Our findings suggest that women who initiate breastfeeding in the hospital may be more likely to breastfeed for a longer duration.

Introduction

Breastmilk is the most nutritious food for infant development and studies show that breastfeeding promotes optimal health outcomes for the mother/infant dyad that have lifelong implications. Additionally, the American Academy of Pediatrics promotes sustained breastfeeding practices for at least the first year of life.[1–3] Although the U.S. Centers for Disease Control and Prevention (CDC) has reported steady increases in breastfeeding practices in the US, attributed in part to support of the medical community and the Baby-Friendly Hospital Initiative (BFHI),[4–7] the prevalence of exclusive breastfeeding is below the Healthy People 2020 targets.[2]

The Baby-Friendly Hospital Initiative (BFHI) is a joint effort started by UNICEF and the WHO to protect, promote, and support breastfeeding practices.[8,9] More specifically, the BFHI seeks to increase positive in-hospital experiences such as initiating breastfeeding within 1 hour of birth, feeding on demand, and breastfeeding education and support, while limiting experiences that hinder early initiation and duration of breastfeeding, such as giving pacifiers or giving gift baskets that include formula.[10] Although studies have demonstrated BFHI's success in improving breastfeeding beyond six weeks, only 28% of U.S. annual births take place in Baby-Friendly certified hospitals. Additionally, implementation strategies vary across hospitals, and there is

still widespread use of supplementation and pacifiers.[11–14]

Furthermore, BFHI implementation in rural hospitals is limited; thus studies that explore BFHI experiences and breastfeeding outcomes in rural regions are needed.[4,15] Close to 80% of the population in both Utah and Wyoming live in rural areas,[16] and both states have birth rates above the national average, with Utah recording the highest birthrate in 2017.[17] In addition, out of the 591 Baby-Friendly facilities in the nation, there is only 1 located in each of these states.[18] No previous studies that have included an analysis of BFHI experiences between Utah and Wyoming because prior to 2016, the Wyoming PRAMS did not include any questions about BFHI experiences.

Therefore, the purpose of this study was to describe the current state of Baby-Friendly practices in Utah and Wyoming and to assess whether BFHI experiences impact breastfeeding termination and duration among new mothers. The study was approved by the University Of Utah Institutional Review Board (IRB) and determined exempt.

Materials and Methods

Study Design and Population:
This study analyzed cross-sectional population-level data for mothers who had recently given birth to a live infant in Utah or Wyoming in 2016 and who completed the CDC Pregnancy Risk Assessment Monitoring System (PRAMS) Phase 8 questionnaire. The CDC developed PRAMS in 1987 as an ongoing, nationwide surveillance system that is state-specific in its sampling scheme and operated within local health departments to collect data related to behaviors and experiences of mothers pre-pregnancy, during the prenatal period, and in the immediate post-natal period.[19,20,21] The PRAMS initiative aims to promote safe motherhood, as well as reduce low birth weight and infant mortality.[22] The PRAMS questionnaire collects information on an array of topics such as maternal knowledge, attitudes and behaviors about pregnancy, breastfeeding, infant health, physical abuse, stress and social support, maternal use of alcohol and tobacco products, and contraception, among others.[23] The recruitment process involves the random selection of potential participants from a sample of birth certificates indicating a recent live birth between two and six months post-partum.[24] Utah oversamples mothers with low education and infants with low birthweight while Wyoming oversamples by maternal race and infant birthweight to ensure that the data is representative of the smaller, higher risk populations.[25,26] Using birth certificates, new mothers are randomly selected, within stratified sampling scheme, to participate in completing the PRAMS survey.[20] Utah and Wyoming select approximately 200 and 140 women each month, respectively, who delivered live births and are at two to six months post-partum.[20,27] Selected mothers receive an introductory letter by mail, followed by a survey that is mailed a week after the introductory letter is sent, followed by third and fourth survey attempts mailed to non-respondents.20 Next, an interviewer contacts those non-respondents who received the mailed survey.[20] The surveys and phone interviews are available and may be administered in English and Spanish to accommodate Spanish-speaking mothers when necessary.[28] Mothers who recorded "Hispanic" on birth certificate information received surveys in English and Spanish.[29] The expected response rate in Utah and Wyoming is 60% – 65% following the CDC protocol.[20,28] The actual response rate for UT in 2016 was 65% and 63% for WY. Once the surveys are received by the local health department, responses are grouped to document the self-reported prevalence data.[28]

Data Sources/Measurement:
Breastfeeding Initiation/Duration Measures
For this analysis, breastfeeding (BF) termination and duration measures were informed via the Utah Phase 8 (2016) and Wyoming Phase 8 (2016) surveys, which included the following questions: "Did you ever breastfeed or pump breast milk to feed your new baby, even for a short period of time?" Respondents with a "yes" answer were then asked, "Are you currently breastfeeding or feeding pumped milk to your new baby?" If response was "no", the respondents were asked, "How many weeks or months did you breastfeed or pump milk to feed your baby?"

In-Hospital Newborn Care Enhancement Measures
Mothers who reported "yes" to breastfeeding their newborn or giving them pumped breast milk, regardless of the duration, were asked to respond to the following questions with a "yes" or "no" answer about their BFHI experiences: 1) "Hospital staff gave me information about breastfeeding"; 2)"My baby stayed in the same room with me at the hospital"; 3) "I breastfed

my baby in the hospital"; 4) "Hospital staff helped me learn how to breastfeed"; 5) "I breastfed in the first hour after my baby was born?"; 6) "My baby was placed in skin-to-skin contact within the first hour of life?"7) "My baby was fed only breastmilk at the hospital"; 8) Hospital staff told me to breastfeed whenever my baby wanted"; 9) "The hospital gave me a breast pump to use"; 10) "The hospital gave me a gift pack with formula"; 11) "The hospital gave me a telephone number to call for help with breastfeeding"; and 12) "Hospital staff gave my baby a pacifier". The prevalence of BFHI experiences for the study population are found in Table 2 and in Figure 2.

Covariates:
In this analysis, the Phase 8 Utah-PRAMS (2016) and Phase 8 Wyoming-PRAMS (2016) were examined to understand if there is an association between in-hospital newborn care enhancement measures as well as early initiation and continuation of BF after delivery. Key demographic, behavioral and experiential factors were identified as potential confounders through a thorough literature review.[6,30–33] Final decisions on potential confounding factors to include were informed by confirming that the factor is associated with one of the BFHI experiences and with the outcome variables of interest (BF termination or duration), that the factor is unequally distributed within the study population, and that the factor is not an intermediary step in the causal pathway from BFHI experiences and the outcome variable.[34,35] The covariates selected for this analysis included maternal age (<20, 20-24, 25-34, 35+), maternal body mass index (BMI) (WHO categories: underweight, normal weight, overweight, obese), household (HH) income (≤$28,000, $28,001-$57,000, $57,001-$85,000, over $85,000), smoked in previous 2 years (no/yes), drank alcohol in previous 2 years (no/yes), delivery method (vaginal or C-section), and the number of days the baby stayed in hospital post-delivery (<1 day, 1–2 days, 3–5 days, 6–14 days, >14 days, or still in). Table 1 delineates these population characteristics by BF duration status for the Utah & Wyoming PRAMS 2016 analysis.

Study Size, Methods, and Statistical Analysis:
The total number of participants between both states included 2,013 women who completed the state-specific PRAMS survey. The total number of participants between both states included 2,013 women who completed the state-specific PRAMS survey. An overview of the sample selection process is illustrated in Figure 1. In Utah, the total number of recorded live births that occurred in 2016 was 50,486 and of those 1,400 women completed the Utah-PRAMS.[36] The Utah analysis excluded 43 women (3%) who did not respond to the ever breastfed question, and 28 women (2%) whose delivery did not occur in the hospital within the state of Utah in 2016. In Wyoming, the total number of recorded live births that occurred in 2016 is 7,384 and of those, 613 women completed the Wyoming PRAMS survey.[37] The Wyoming analysis excluded 28 women (4.6%) who did not respond to the ever breastfed question, and 12 women (2%) whose delivery did not occur in the hospital within the state of Wyoming in 2016. The weighted response rate was 63% in Wyoming.[26] After exclusions, a total of 1,901 women (n=1328 from Utah and n=573 from Wyoming) were included in the analysis.

Descriptive population characteristics were used to compare mothers from Utah and Wyoming according to BF initiation, termination or duration. Prevalence ratios (PR) were calculated with 95% confidence intervals (CI) to evaluate the relationship between BF termination or duration and mother's BFHI experiences, using unadjusted and adjusted Poisson regression. Analyses were completed using SAS version 9.4 (SAS University ed.) and STATA 15.1 (Stata Corp, LLC). Survey data were weighted according to PRAMS methodology such that the sample was representative of all mothers who delivered during 2016 in Utah and Wyoming.

Results

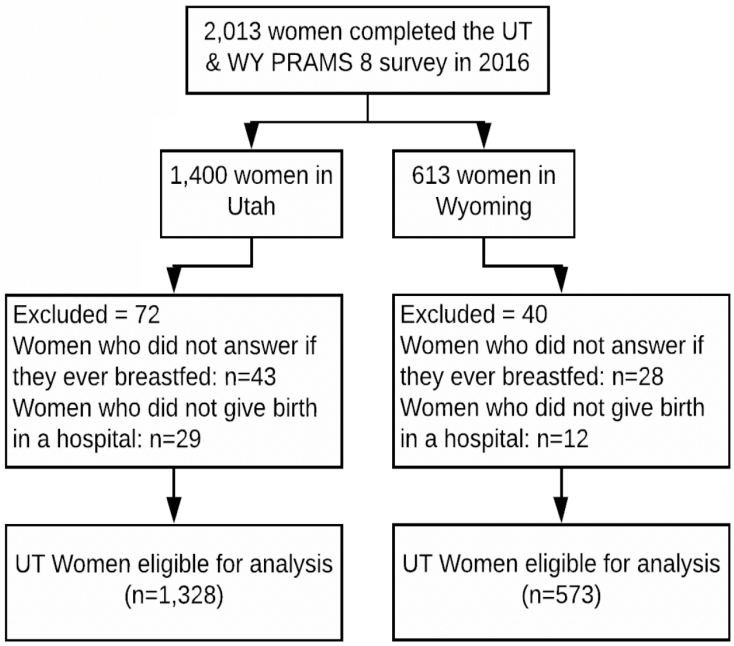
Participants from Utah were 15–45 years old, while participants from Wyoming were 15–43. The average age of participants from both states was 28 years old. Participants from both states completed the survey on an average at 16 weeks postpartum. The interquartile range for Utah was 13–20 weeks with a range of 10–32 weeks, while in Wyoming the interquartile range was 13–18 weeks with a range of 10–37 weeks. The percentage of survey respondents who reported BF initiation was 93.4% in Utah and 90.5% in Wyoming. 69.5% of mothers in Utah and 68% in Wyoming reported they were still BF at the time of survey completion. Exclusive BF was reported by 59.9% in Utah and 70.4% in Wyoming. The average number of weeks mothers

breastfed was 12.8 weeks in Utah versus. 12.3 weeks in Wyoming.

Figure 1 outlines the prevalence of each of the BFHI in each state, with "Baby breastfed in the hospital" having the highest prevalence in each state (95.0% in Utah and 95.1% in Wyoming) and staff giving breast pump for breastfeeding having the lowest prevalence (35.5% in Utah and 24.0% in Wyoming).

17.7% of participants from Wyoming reported BF <2 months and 82.3% breastfed for 2 months or longer compared vs. 17.6% <2 months and 82.4% in Utah. In both states, women who breastfed for 2 months or longer versus <2 months tended to be older, of normal weight, higher income, non-alcohol consumers, non-smokers, having a vaginal delivery, and fewer days in the hospital (Table 1).

Figure 1. Flow diagram explaining the final cohort of women in the analysis.



Flow model of participant exclusions from analysis.

Figure 1: Flow diagram explaining the final cohort of women in the analysis

Table 1. Population Characteristics by Breastfeeding Duration (<2 vs. ≥2 months: Utah and Wyoming PRAMS Phase 8, 2016

		Utah			Wyoming	
Characteristics	Utah Overall	Breastfed <2 months 17.6%	Breastfed ≥ 2 months 82.4%	Wyoming Overall	Breastfed <2 months 17.7%	Breastfed ≥ 2 months 82.3%
Age, mean (SE)	28.8 (0.2)	28.0 (0.5)	28.9 (0.2)	28 (0.3)	26.2 (0.7)	28.4 (0.3)
Age (Category), (%)						
<20	6.2	13.4	4.5	8.1	12.9	6.7
20–24	19.2	20.4	18.9	20.3	33.2	16.8
25–34	58.3	47.6	60.8	58.8	43.1	63.0
35+	16.3	18.7	15.8	12.8	10.8	13.5
BMI, (%)						
Underweight	5.4	6.1	4.9	3.8	4.7	3.3
Normal Weight	50.9	33.9	55.5	50.6	34.6	54.8
Overweight	25.2	31.2	23.7	25.9	32.2	24.3
Obese	18.6	28.8	15.9	19.8	28.5	17.7
Household Income, (%)						
≤$28,000	24.9	39.1	20.5	37.0	56.1	30.9
$28,001–57,000	31.6	24.8	33.6	20.7	17.7	21.4
$57,001–85,000	23.3	20.1	25.0	15.8	15.5	16.1
>$85,000	20.2	16.0	20.9	26.6	10.8	31.5
Drank Alcohol, (%)						
No	67.2	56.3	69.6	33.2	31.1	33.1
Yes	32.8	43.8	30.4	66.8	68.9	66.9
Smoked, (%)						
No	85.9	78.0	88.0	71.6	66.5	74.0
Yes	14.1	22.0	12.1	28.4	33.5	26.0
Delivery Method, (%)						
Vaginal	79.3	70.0	81.1	72.3	75.2	74.5
C-section	20.7	30.0	18.9	27.7	24.8	25.5
Hospital Length of Stay, (%)						
<1 Day	5.1	2.3	5.4	4.9	8.6	3.6
1–2 Days	65.1	59.4	66.0	70.0	67.8	72.1
3–5 Days	22.1	26.9	21.5	18.4	17.8	17.4
6–14 Days	4.3	4.7	4.2	4.0	1.5	4.5
>14 Days	3.1	6.6	2.4	2.6	4.3	2.3
Still in	0.3	0.1	0.4	0.1	0.0	0.1

Weighted frequencies and mean (standard error [SE]) were calculated accounting for the stratified survey sampling.

Table 1: Population characteristics by breastfeeding duration

Unadjusted analysis of each BFHI experience and the association on breastfeeding duration for each state was assessed. In Utah, findings indicated that 8 of 12 the experiences—feeding baby in hospital, giving gift with formula, giving breast pump, engaging in skin to skin in the first hour, BF in the first hour, feeding only breastmilk, baby staying in the room, and giving pacifier by staff — were associated either positively or negatively with BF duration (PR=1.59, 95% CI (1.23, 2.04), PR=0.88, 95% (CI 0.83, 0.93), PR=0.89, 95% CI (0.83, 0.96), PR=1.15, 95% CI (1.04, 1.27), PR=1.2, 95% (CI 1.09, 1.33), PR=1.20, 95% CI (1.12, 1.29), PR=1.15, 95% CI (1.03, 1.29), and PR=0.87, 95% (CI 0.82, 0.92) respectively) (Table 2). In Wyoming, findings indicated that 4 of 12 the experiences—feeding baby in hospital, staff giving breastfeeding help telephone number, feeding only breastmilk in the hospital, and giving pacifier by staff — were associated either positively or negatively with BF duration (PR=1.69, 95% CI (1.08, 2.65), PR=1.23 95% (CI 1.06, 1.43), PR=1.22, 95% CI (1.07, 1.39), and PR=0.88, 95% (CI 0.80, 0.97 respectively).

After adjusting for other BFHI experiences and confounding factors (maternal age, maternal BMI, HH income, alcohol use, smokers, delivery method and hospital length of stay), the only BFHI experience significant for BF duration (≥ 2 months versus less) for both states was starting breastfeeding in the hospital: adjusted prevalence ration [aPR] = 1.49, 95% CI (1.12, 1.98) in Utah and aPR=2.03, 95% CI (1.13, 3.64) in Wyoming. In Wyoming only, staff giving BF help telephone number or exclusive feeding of breastmilk in the hospital were significant predictors of longer BF duration, aPR=1.18, 95% CI (1.01, 1.39) and aPR=1.16, 95% CI (1.00, 1.34), respectively, while staff giving breastfeeding information or having baby stay in the hospital room with mother were associated with shorter BF duration, aPR=0.78 (95% CI: 0.64, 0.96) and aPR=0.76 (95% CI: 0.65, 0.90), respectively. Conversely, in Utah, staff who gave a gift that included formula were more likely to report early BF termination (<2 months), aPR=0.93, 95% CI (0.87,0.99)], this was not the finding for Wyoming.

Table 2. Breastfeeding Duration (≥2 months vs < 2 Months) by BFHI Experiences: PRAMS Phase 8, 2016; Utah, n=1125 and Wyoming, n=509

BFHI Experiences	Utah										Wyoming								
	Unadjusted PR(95% CI)			*Model 1 PR(95% CI)*			*Model 2 PR(95% CI)*				*Unadjusted PR(95% CI)*			*Model 1 PR(95% CI)*			*Model 2 PR(95% CI)*		
	PR	**(95% CI)**		**PR**	**(95% CI)**		**PR**	**(95% CI)**			**PR**	**(95% CI)**		**PR**	**(95% CI)**		**PR**	**(95% CI)**	
Baby breastfed in hospital	1.59	(1.23	2.04)	1.49	(1.13	1.97)	1.49	(1.12	1.98)		1.6925	(1.08	2.65)	1.61	(1.02	2.53)	2.03	(1.13	3.64)
Staff gave breastfeeding help phone #	1.08	(0.99	1.17)	1.04	(0.95	1.13)	1.04	(0.94	1.14)		1.23	(1.06	1.43)	1.31	(1.11	1.55)	1.18	(1.01	1.39)
Staff gave gift w/formula	0.88	(0.83	0.93)	0.92	(0.86	0.98)	0.93	(0.87	0.99)		0.95	(0.86	1.04)	1.01	(0.92	1.11)	1.00	(0.92	1.10)
Staff gave breast pump	0.89	(0.83	0.96)	0.97	(0.89	1.06)	0.98	(0.89	1.07)		0.98	(0.87	1.09)	0.99	(0.86	1.13)	0.98	(0.86	1.13)
Skin-to-skin within 1st hour	1.15	(1.04	1.27)	1.00	(0.88	1.14)	1.02	(0.89	1.18)		0.99	(0.89	1.11)	0.90	(0.77	1.04)	0.93	(0.79	1.08)
Staff gave breastfeeding info	1.13	(0.95	1.35)	1.09	(0.92	1.30)	1.04	(0.87	1.23)		0.96	(0.83	1.11)	0.76	(0.63	0.92)	0.78	(0.64	0.96)
Breastfed within 1st hour	1.20	(1.09	1.33)	1.06	(0.93	1.20)	1.06	(0.93	1.21)		1.10	(0.96	1.23)	1.07	(0.91	1.27)	1.06	(0.90	1.26)
Staff helped learn to breastfeed	0.90	(0.88	1.00)	0.93	(0.87	0.99)	0.94	(0.87	1.00)		1.00	(0.88	1.10)	0.96	(0.85	1.08)	0.99	(0.87	1.11)
Fed only breast milk in hospital	1.20	(1.12	1.29)	1.11	(1.03	1.20)	1.07	(0.98	1.15)		1.22	(1.07	1.39)	1.15	(1.00	1.33)	1.16	(1.00	1.34)
Baby stayed in hospital room	1.15	(1.03	1.29)	1.03	(0.89	1.19)	1.12	(0.95	1.31)		0.97	(0.85	1.10)	0.73	(0.60	0.88)	0.76	(0.65	0.90)
Staff said to feed on demand	1.07	(0.98	1.17)	0.97	(0.89	1.06)	0.98	(0.89	1.08)		1.15	(0.97	1.35)	1.13	(0.94	1.36)	1.05	(0.87	1.26)
Staff gave pacifier	0.87	(0.82	0.92)	0.92	(0.87	0.98)	0.95	(0.89	1.02)		0.88	(0.80	0.97)	0.90	(0.82	0.99)	0.92	(0.83	1.01)

Prevalence ratios (PR) were calculated with 95% confidence intervals (CI) using unadjusted and adjusted Poisson regression with robust error variance, accounting for the stratified survey sampling.

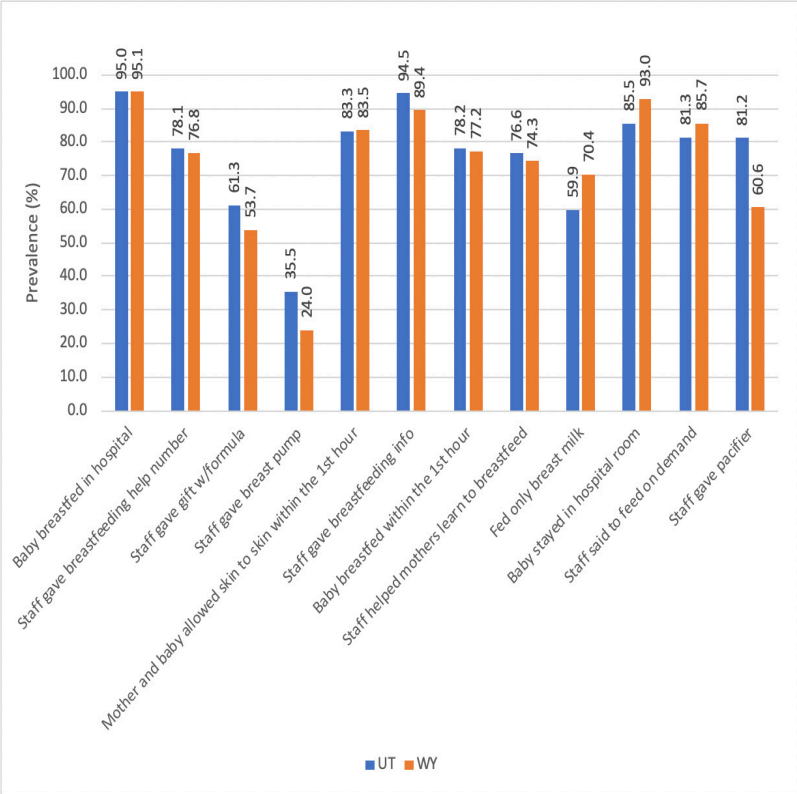
Model 1: Adjusted for other BFHI experiences.

Model 2: Adjusted for other BFHI experiences and maternal age (<20, 20-24, ^25-34, 35+), maternal BMI (WHO categories: underweight, ^normal weight, overweight, obese), HH income (≤$28,000, $28,001-$57,000, ^$57,001-$85,000, over $85,000), smoker, drinks, delivery method (^vaginal or C-section), #days bb stayed in Hospital (<1 day, 1-2 days,
^3-5 days, 6-14 days, >14 days, still in).

BFHI, baby friendly hospital initiative; PR, prevalence ratio; CI, confidence interval; ^, referent group.

Table 2: Unadjusted analysis of each BFHI experience and the association on breastfeeding duration for each state

Figure 2: Prevalence of Baby-friendly Hospital Initiative Steps: Utah and Wyoming PRAMS



Mothers who indicated that they had breastfed their baby were asked yes or no questions about different hospital experiences that they may have had when their baby was born. Response rate was ≥84%.

Figure 2: Prevalence of Baby-Friendly Hospital Initiative Steps: Utah and Wyoming PRAMS

Discussion

This population-based study provides a representative, preliminary description of the current state of breastfeeding for mothers who delivered a live birth in Utah and Wyoming during the first year (2016) Phase 8 PRAMS. It offers a first ever look at how BFHI experiences impact breastfeeding termination and duration in these rural mountain west states. We found approximately equal prevalence of breastfeeding duration in both states, with approximately 82% of postpartum women reporting breastfeeding for 2 months or more. Additionally, we found that, in relation to BF duration, only women who started breastfeeding in the hospital, had increased likelihood of BF ≥2 months, with Utah having a 49% increase and Wyoming having a 103% increase after adjusting for other BHFI experiences and confounding factors. Wyoming, however, also showed that staff giving breastfeeding help telephone number, and those who fed only breastmilk in the hospital also significantly increased the likelihood of breastfeeding 2 or more months (18% and 16%), respectively. Interestingly those with increased risk of early breastfeeding termination (< 2 months) were those given breastfeeding information by staff and those who had their babies room-in with them 24/7 (22% and 24%), respectively. Those to whom staff gave a pacifier, did not show significant association with breastfeeding duration in either state; however, these were significant risks for early termination for the first multivariate analysis model that controlled only for other BFHI experiences and not the other confounders included in the fully adjusted model. In Utah, those who were given formula were 7% more likely to terminate breastfeeding before 2 months.

Our results regarding starting breastfeeding in the hospital, giving only breast milk, and providing help telephone numbers are consistent with other research.[11] Our results showed that giving pacifiers did not significantly impact breastfeeding duration. Although this finding may be counter-intuitive, it is supported by large RCTs that also showed no impact.[39] Our findings that showed negative impacts from rooming-in and provision of staff help are contradictory to other findings,[12] and may be due to reverse causation (i.e., women who require infant to be in the room with them or who need help from staff breastfeeding may be women who are having greater difficulties breastfeeding and thus it is not the BHFI but rather the difficulty breastfeeding that drives the association).

The limitations present in our study should be considered when interpreting our findings. Reporting biases are likely because data were not available for race/ethnicity or pre-term delivery, both of which are known to impact breastfeeding initiation and duration.[31] Similarly, there was no information on the hospitals where the infants were born, and subsequently, no information on the status of the hospital's Baby-Friendly designation. Possible recall bias may exist in that women who breastfed longer may differ significantly in their recollection of BFHI experiences than those who did not. Additionally, the impact of parity as a potential confounder was not addressed in our analysis. Further, generalizability is limited as the study focuses exclusively

on the Mountain West region. However, for states with limited access to BFHI designated hospitals, our findings may be more relevant.

Despite these limitations, there are several strengths of the study. First, we utilized weighted data to represent all mothers who gave birth from 2016 in Utah and Wyoming. The sample size of the study was also reflective of these populations with weights to ensure the inclusivity of at-risk women. Furthermore, this is the first time Wyoming has included the BFHI experiences question in their PRAMS survey. Thus this study has the unique strength of being the first to compare these two very similar populations.

Conclusion

In conclusion, our results demonstrate the importance of initiating and exclusively breastfeeding in the hospital as well as providing help telephone numbers for women about breastfeeding prior to discharge. More specifically, our findings indicate that small rural hospitals may be able to improve breastfeeding duration by implementing these specific BFHI recommendations. Additionally, our results suggest that giving a gift pack with formula in the hospital is associated with stopping breastfeeding before two months for both states, but providing a pacifier is not associated with breastfeeding duration. There is strong epidemiological support for the health benefits to both mother and infant for exclusive breastfeeding to 6 months and prolonged breastfeeding until at least 1-year, and along with the U.S. Preventive Services Task Force (USPSTF), the WHO and UNICEF we also strongly promote and encourage this practice.[1–3,38]

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Title IX and Its Impact After 40 Years: Understanding Physical Activity Perspectives of Adolescent Girls

Caren J. Frost, Janet Shaw, Karen O'Toole, Julie Metos, Timothy Brusseau Jr. Endi Moric, & Lisa H. Gren

/ University of Utah

Abstract

Objective: Despite increases in sport participation among girls since the passing of Title IX legislation, girls still tend to have lower physical activity in comparison to boys. The aim of this pilot study was to better understand perspectives of adolescent girls about physical activity.

Methods: Ten girls aged 13 to 17 years were invited to participate in two, one-hour, structured focus groups using a phenomenological approach. Convenience sampling was used for this pilot study. The girls were queried about the physical activities they do, their enjoyment of that activity, their thoughts about others engaged in physical activity, reasons why girls stop physical activity, and ideas about how girls can be helped to re-engage in physical activity if they ended sport participation in high school.

Results: Four themes from the focus groups were identified, including Inspiration/Motivation, Comradery, Accomplishment, and Fairness. On a positive note, girls participated in many types of physical activity, both in and out of school, and recognized its benefits from physical, social and psychological perspectives. On a negative note, they spoke at length about school-related discrepancies relative to unequal treatment of boys' and girls' sports teams.

Conclusions: In this group of girls, physical activity was lauded as a healthy and enjoyable behavior, yet displeasure with school preferences for acknowledging and supporting boys' sports was a stark reminder of the gender gap that still exists in school settings for promoting girls' exercise activities.

Introduction

It has been 40 years since Title IX legislation was passed in the U.S. One of the issues this Title was designed to end were "barriers in sports for women and girls."[1] Slightly over a decade ago, McCallister, et al. qualitatively queried pre-adolescent children about sports and found that sports participation was viewed as having primarily masculine characteristics and that performing sports "like a girl" was viewed as negative and derogatory.[2] In the U.S., boys outnumber girls' high school sport participation and boys have higher participation in outdoor recreation pursuits than similarly aged girls.[3,4] Girls still lag behind boys in school-based physical activity.[3,4]

Since recent research points to school teachers as having major influences in girls' attitudes toward and participation in extracurricular sports, schools are considered an opportune location to promote physical activity for children and adolescents.[5,6] While state curricula and school grade level dictate physical education requirements, many school extracurricular opportunities can promote physical activity for girls. As we were working with families impacted by breast cancer and examining the potential impact of physical activity, we wondered whether there has been an increase in positive attitude, perception and practice linked to physical activity in adolescent girls compared to that observed in the past. We conducted a preliminary feasibility study to determine how willing teen girls would be to provide information about their physical activities.

Methods

We used a convenience sample to invite a group of adolescent girls (10 girls aged 13-17 years) to participate in a focus group. At the focus group, we discussed (a) their lived experiences with physical activity and (b) their thoughts, feelings and rationale for participation in physical activities. We used a short interview schedule, of six open-ended questions, that allowed us to guide the participants in the discussion. The conversation lasted 60 minutes and was audio recorded and transcribed. We reviewed the transcript using open coding to identify overarching themes. As we worked through the transcript, we reviewed the information line-by-line to determine what ideas the participants used to describe their experiences with physical activity. The study team discussed the emerging themes in detail to ensure that we had a clear interpretation of the information. The information from these conversations indicated that although they enjoy physical activities in school settings, girls may end their participation early due to lack of support and recognition by teachers and school administration. All study procedures were approved by the Institutional Review Board of the University of Utah.

Results

These young women were involved in a number of physical fitness and exercise activities, which included traditional aerobic conditioning exercise such as running, "intense fitness classes," dance, and physical education class; sports, such as ice hockey, soccer, swimming, track, tennis and water polo; and individual activities such as weight training, hiking and yoga. Based on our conversation with these youth, four overarching themes came to light, i.e., Inspiration/Motivation, Comradery, Accomplishment, and Fairness, which are important for how girls see their participation and value of their efforts in physical activities at school.

Inspiration/Motivation:
The participants were asked what they thought about when they saw other girls participating in physical activities. They noted that "it's inspiring" when watching peers and/or star athletes. In addition, one participant stated, "You can **see how far you have come**" when thinking about her own workouts. This inspiration connected the girl's internal motivation for exercise and developing physical fitness. In terms of positive effect, participants noted different reasons for doing physical activities:

- "I just do it because it gives me something to do. If I go home right after school, I will just do nothing. Sports kind of give focus because I know I have a limited time to do homework and stuff."
- "I do it because I want to stay healthy and fit…just kind of for my own good."

Comradery:
Participants noted that having friends and others work out with them enabled them to maintain a level of interest in physical fitness. Having this type of comradery linked to external motivations for completing physical activity and having a companion to work with meant possible accountability and/or fun, and allowed individuals to select an activity for which the impact of friends was key. When asked about what types of things might help them increase their physical activity, the participants noted:

- "If people **encourage them** to do it, . . . they will try harder."
- "Doing it with their **friends**."

Accomplishment:
The girls were asked how they felt when they moved a lot and/or if they were expected to move a lot in their activities. Their responses related to a sense of accomplishment, both with being involved in physical activity and with putting forth a best effort:

- "…I know I was there; I was doing my best. I know it is going to pay off and it is worth it to be there. I always feel really good about that."
- "I feel accomplished, like . . . I did something besides just sitting there, wasting my time."

Fairness:
One area that evolved from the conversation was about the lack of community recognition for girls' activities. Although this was not a topic we specifically intended to query, it was clear that the issue of public recognition for sports participation was of major concern to the girls; they initiated this part of the discussion. The participants were asked why girls stop participating in physical fitness activities, especially in comparison to boys. Their responses were connected to perceived community preference for boys' activities and realization that boys were more often pushed into sporting

activities and recognized for these activities:

- "I think that sports is not something that is as pressured as much on girls than as boys. I think that sometimes it does not feel as important to girls. So I think it is not as emphasized."
- "People talk to guys about sports more. I have seen teachers come into rooms and start asking the guys like how is baseball going, how is basketball coming? But they do not ever ask girls about it."
- "At our school, there are so many girls who are so into their sports. It is just no one gives them the recognition. We do not have fan clubs for those [girls'] teams. We have fan clubs for the boys' teams though."

Discussion

The results of this feasibility study provided important insights into the physical activity experiences of teen girls. Our four themes, Inspiration/Motivation, Comradery, Accomplishment, and Fairness, are largely supported by a recent review by Standiford, who categorized themes into somewhat larger categories of Perceptual, Interpersonal and Situational influences for participation.[7] The strongest statements from this group of adolescent girls were captured in the construct of Fairness in our study, and articulated as "contending with boys" by Standiford.[7] The girls in our study were queried as to why many girls do not persist in sport and exercise participation. The response of the girls was notably strong relative to the role of schools in supporting the boys and affording girls little, if any, recognition. Girls stated that schools allowed students to leave school early or even allowed students to miss school on days when the boys' football or basketball teams were playing in a championship game:

- "So if we are in the state championships or anything, we will get out early if it is boys. But if it's the girls, we do not get out early."
- "Our drill team actually went to state and it was not a school excused. Like they encouraged us to go, but it was not school excused. But for the guys' basketball team, it was a school-excused thing."

Such actions were taken to ensure that the boys' teams would have fan support from peers, teachers and other school personnel. Our participants reported that this type of school support was never offered to girls' teams. Further, school administrators would often announce upcoming boys' team events during morning announcements, but would rarely provide the same information about girls' teams. As noted in the statements below, teen girls experienced lack of support due to clear preference for teen boys' activities:

- "Like they come over the intercom or the teacher tells you like oh there is a football game tonight. There is also a tennis game tonight, but. . ."
- "Our school glorifies our football team. They glorify our basketball team. But our girls' tennis team and our girls' soccer team like none of the girls' teams get as much recognition as our basketball team or our football team."
- "Swimming will be like region champions and then people will be like, "I didn't know we had a swim team." It is like yes we do have a swim team. [laughter] We are there."

While we suspected that girls would address inequities between girls and boys in the realm of physical activity, exercise and sport, we were surprised at the girls' level of discontent with schools and their seemingly frank disregard for girls' roles in sport.

Public Health Implications:

Existing practices that perpetuate the notion that boys are better at sports and, therefore are favored over girls in sport settings, were described by the girls in the present study and have been reported elsewhere.[5] Wetton and colleagues noted that, among a sample of 60 girls aged 15 to 16 years old, perceived lack of ability, negative experiences in physical education classes, and teacher preference for working with skilled students were reasons girls did not participate in team sports.[5] The girls in our present study stated that favoritism for boys' sports was perpetuated by the school environment and, in particular, unsupportive teachers. Participation was considered a highly visible expectation for boys and a low-priority option for girls. Interestingly, one girl in the study described physical activity opportunities as a socially acceptable outlet for her aggression (a sentiment that resonated with the group), especially against boys.

The role of physical activity in promoting a multitude of health benefits was mentioned by our participants in the present study and by young women from other countries.[5,8,9] The participants in this study specifically described the immediate benefits of physical activity such as stress management, sense of accomplishment, and being a healthy person. They also recognized that

school credit can be earned through physical education class, which was viewed as positive. In terms of public health, there seems to be an overall lack of physical activity support for young women. This area is one in which public health professionals could conduct more research and develop clear models about why physical activities are important for young women as well as how to create a culture of support for young women's participation.

Social aspects of physical activity were highly valued by the girls in the current study including friendship, meeting new people and being a team member. The general influence of others is captured by Standiford as Interpersonal Influences and includes parents and teachers in addition to friends; though the present group of girls did not mention teachers as positively influencing their own participation, they were very outspoken about the discrepancy between teachers' support of boys' sports versus girls' sports, suggesting that teachers could have a positive influence on their own participation.[7] A recent school-based intervention aimed to improve health behaviors among adolescents, including increased physical activity and decreased sedentary time, was favorable for promoting such changes.[10] However, physical activity improvements were most notable among the boys and sedentary time among the girls did not decrease. Thus, a social system of support for girls needs to be developed with a public health lens to promote physical activity options for females in the school system.

This study supports the work of others and brings new information to the effort to increase physical activity among teen girls. Specifically, we found that girls enjoy team sports and recognize the benefits of teamwork; they use physical activity to manage stress and aggression; and they can be discouraged by stereotypical attitudes. Based on a review article about the motivation for participation in sports by Deaner, Balish, and Lombardo, the finding about team sports participation appears to be potentially novel since research has indicated that females' rationale for sports participation is very different from males' rationale.[11] In fact, one qualitative study, which connects to the work by Deaner, Balish, and Lombardo, noted that physical education teachers' approaches to increasing girls' participation found that teachers' strategies were, in fact, largely based upon gender stereotypes, despite recent advancements in physical education curricula.[12] Albeit small, this study supports persistent gender stereotypes in school physical education programming and links to the findings from our focus group discussion—that boys' sports activities are held out as most important illustrating that boys are expected to participate in sports, but girls are not.

Conclusion

In summary, based on the comments made by the girls in the focus group, the school environment is a place that can potentially improve the physical activity participation of adolescent girls. Promoting physical activity can be achieved by having policies that ensure that girls' sports are promoted and noted at the same level as boys' sports. For example, if school attendance is waived on days when boys' sports teams are competing in championship situations, it seems higher level policy makers ought to be part of this support for girls' participation as well. Schools should ensure that students understand that physical activities through the sports for males and females are on equal footing as "events" that students are expected to support by their attendance.

Another potential policy change would be to enhance opportunities for girls to participate in the same variety of sports that boys are offered. One example is intramural sports and recreational physical activities that are organized at a variety of skill levels, and another is to not categorize physical education offerings by gender. The proposed variations could help girls increase physical activity while enjoying the social and teamwork benefits of physical activity they like, since these are factors that encourage their participation. Although less is known about the types of variation that might best promote ongoing physical activity for girls, research questions to be considered might include whether same sex physical education classes promote girls participating in physical activity for more years. Answers to these types of questions should be gathered through research to inform revised policies.

Finally, girls in this study identified a variety of benefits associated with participating in physical activity in addition to physical health. These included spending time with friends, feeling a sense of accomplishment, and managing emotions and stress. As schools address the current mental health issues of students, physical

activity can be prioritized as a tool to promote mental wellness.

Forty years after the passage of Title IX legislation, it is clear that significant strides still must be made to address the issues related to sex-based discrimination. Schools should play an important role in promoting gender equality by creating a welcoming environment for girls' participation in organized sports as well as other physical activities. Creating a supportive environment for physical activities and sports for girls in educational settings can promote continued activity into adulthood for women.

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Gender and Surgical Provider Role Differences in Opioid Prescribing Practices among Different Patient Populations

Heather F. Thiesset, Lyen C. Huang, Virginia L. Valentin, Lisa H. Gren, & Christina A. Porucznik
/ University of Utah

Abstract

Background: Patients living in rural communities and patients with a cancer diagnosis are two populations potentially overlooked in opioid prescribing clinical decision making that may relate to the amount of over-prescribed opioids in the postsurgical environment. Provider gender, surgical role, attitudes and knowledge may affect prescribing practices for these at-risk populations, but little research has been conducted to date assessing the interplay between these different factors.

Methods: A 35-item questionnaire was administered to surgeons, residents/ fellows (trainees), and advanced practice clinicians (APCs). Frequency statistics compared differences in provider attitudes, perceptions, and practices by gender, role, age, and time in practice looking at patients in rural versus urban communities as well as cancer versus non-cancer patients.

Results: Female providers were more likely to worry about their cancer patients being addicted to opioids and more likely to e-prescribe to rural patients. Surgeons and trainees self-reported that they gave the same amount of opioids to rural patients as urban patients however APCs were more likely to have no change in their prescribing practices ($p=0.02$). APCs were more likely to agree that it is easy to e-prescribe (56%) than surgeons (41%) and trainees (35%), so rural patients do not need different consideration. Surgeons (50%) and trainees (50%) agreed compared to APCs (0%) that it is easier to give more opioids so a patient does not have to get refills if needed for pain ($p=0.03$). Compared to APCs (5%), 21% of surgeons and 45% of trainees acknowledged giving more opioid narcotics to patients with cancer than patients without a cancer diagnosis ($p<0.001$). APC's were mostly female (69%).

Conclusions: While surgeons and trainees reported that they usually gave the same amount of opioids to rural patients, APCs were more likely to report that they didn't change their practice based on a patient's rural location, furthermore, providers differed in their knowledge about e-prescribing and what healthcare access disparities may exist for the rural patient. Surgeons and trainees were more likely than APCs to give more opioids to their cancer patients in comparison to their non-cancer patients. Responses indicate an opportunity to provide educational interventions with providers adapted to differences in gender and roles to identify potential solutions for improving opioid prescribing practices in rural verses urban and cancer verses non-cancer patients.

Introduction

Opioid overprescribing has been attributed as a major cause of the opioid epidemic currently facing society.[1,2] Prescribing providers' behaviors contribute to over-prescribing of opioid narcotics.[3,4] Knowledge of opioid prescribing guidelines and drug monitoring programs can help providers in clinical decision making regarding opioid prescribing for their patients.[5] Therefore, understanding surgical providers' prescribing behaviors and how they differ based on gender and their surgical role can lead to tailored interventions with the goal to reduce the amount of opioids that are overprescribed.

Differences in patient opioid use and gender are well documented as it relates to the opioid epidemic.[6, 7, 8]

However, while these issues have been described, gender differences related to opioid prescribing have not been adequately addressed, nor have interventions and programs related to reducing opioid prescribing at the provider level.[9, 10] Though female providers often represent a minority in the surgical setting[11], their beliefs and practices can have a big impact on their patients.

Rural patients have also been shown to be at higher risk for opioid misuse due to socioeconomic factors and prior illicit drug use.[12, 13] Rural occupations are often more physically demanding putting patients at higher risk for chronic pain and injuries since they often include mining and farming.[14, 15] In fact, it has been estimated that patients living in rural areas are 20-30% more likely to fatally overdose on opioid narcotics than patients living in an urban setting partially due to demographic factors, but also because of difficulties in access to emergency care facilities and services.[16] Prescribing providers have to balance the pain management needs of their patients living in rural areas and their access to care with the high potential for misuse.

Cancer patients are another population warranting additional considerations for postsurgical pain management, since their needs tend to involve both acute after surgery pain as well as chronic pain caused by their malignant condition.[17, 18] It is estimated that 40-50% of cancer patients have moderate to severe pain during cancer treatment as well as after when they are in remission and beyond.[19] The risk of new and persistent opioid use in opioid-naïve cancer patients is reported to be as high as 10.4%.[19] With the potential for opioid dependence occurring in as little as days,[20, 21] this unique combination of acute and chronic pain creates a maelstrom for cancer patients.

The aim of this study was to understand differences in gender and role between surgeons, trainees, and advanced practice clinicians (APCs) regarding postsurgical opioid prescribing to populations of rural verses urban and cancer verses non-cancer patients.

Methods

Study Design:
This was a descriptive, cross-sectional survey on provider opioid prescribing, we examined differences in providers' opioid prescribing attitudes, perceptions, and practices regarding patients with cancer diagnoses and those living in rural areas. The study was a single-institution study within the University of Utah Health, Department of Surgery between July and September 2018. The study received approval from the University of Utah Institutional Review Board.

Survey:
An anonymous, 35-question instrument including demographic multiple choice and 5-point Likert scale items was developed by an expert committee. Questions were generated based upon anecdotal evidence of prescribing increases in rural and cancer populations and a review of the literature. The questionnaire was then iteratively pilot tested with four volunteer surgeons from multiple disciplines within the target population, who reviewed the questions for content applicability in April 2018. Changes were made based on feedback received and applied to the final questionnaire. During July through September 2018, an electronic link to the web-based REDCap[22] questionnaire was provided to 242 providers (surgeons, residents/fellows (trainees), and advanced practice clinicians [APCs]) in nine disciplines at the University of Utah Health Department of Surgery. Participants were asked to self-identify their gender as male, female, or an open ended category that they could write in any gender identification.

Statistical Analysis:
Descriptive statistics were calculated on categorical variables. Univariate analyses were conducted using the chi-squared tests or Fisher's exact test, as appropriate. The primary outcomes were self-reported practices of increased prescribing to patients with cancer or living in a rural location.

Likert scale questions were combined to show agreement ("agree" and "somewhat agree") and disagreement, neutral was kept in a separate category due to low numbers in some categories. Frequency statistics compared differences in attitudes, perceptions, and practices by gender, role, age, and time in practice. The primary outcome variable was giving increased opioids to rural and cancer patients by surgical role. Prevalence ratios were generated using log-binomial models with surgeons as the reference group for dichotomous variables, with categorizing of variables into agreement and disagreement. 95% confidence intervals were also calculated. Covariates were adjusted on provider age and gender to account for differences in training and

socially constructed roles and behaviors associated with gender. Data analysis was completed using Stata 15.1 software (College Station, TX).

Results

A total of 153/242 participants (64% response rate) responded to the questionnaire, with 86 (56%) surgeons, 31 (20%) trainees, and 36 (24%) APCs (Table 1). Females represented a minority at 33% of the total population, which is consistent with the target population demographics in the Department of Surgery, however, they had a 92% response rate. APC's were mostly female (69%). The nine divisions within the Department of Surgery include: General Surgery, Transplant and Hepatobiliary Surgery, Emergency Medicine, Cardiothoracic Surgery, Vascular Surgery, Urology, Otolaryngology, Pediatric Surgery, and Plastic Surgery.

Table 1: Demographics, by Gender

	Male (n=100)	Female (n=53)	P value Chi Squared
Role			
Surgeons	69 (69%)	17 (32%)	<0.001
Residents/fellows	20 (20%)	11 (21%)	
APCs	11 (11%)	25 (47%)	
Age			
20-29	3 (3%)	11 (21%)	0.01
30-39	37 (37%)	24 (45%)	
40-49	34 (34%)	13 (25%)	
50-59	19 (19)	2 (4%)	
>60	7 (7%)	2 (4%)	
Years in practice			
<5	29 (33%)	20 (51%)	<0.001
5-9	18 (21%)	7 (18%)	
10-20	24 (28%)	9 (23%)	
>20	16 (18%)	3 (8%)	

Table 1: Demographics by gender

agreed or somewhat agreed that they worry about rural patients having pain with no open pharmacies on nights and weekends (p=0.06). APCs were more likely to agree that it is easy to e-prescribe (56%) than physicians (41%) or trainees (35%), so rural patients do not need different consideration (p=0.09) (Table 4). Surgeons (29%) and trainees (24%) were more likely to agree that rural patients have trouble refilling opioid prescriptions because they have to travel long distances than APCs (0%)

There was significant variation in role, age, and years in practice between men and women (with women tending to be APCs, younger, and have fewer years in practice) (p<0.001).

In unadjusted univariate analyses, females responded similarly to males in their agreement and/or disagreement in the categories looking at differences between rural and urban patients as well as in cancer versus non-cancer patients (Table 2).

In contrast to separate questions, prescribing providers (surgeons [95%], trainees [84%], and APCs [100%]) self-reported that compared to urban patients, they give the same amount of opioids to rural patients. However, when questioned further, trainees acknowledged being more likely to give more opioids to rural patients (surgeon versus trainee, adjusted prevalence ratios (aPR)= 3.9, 95% CI 1.4-38.0) (p=0.02) (Table 3). Surgeons (96%), trainees (71%) and APCs (90%) all

Table 2: Comparison survey respondents, by Gender

Attitudes/ perceptions					
			Male (n=100)	Female (n=53)	P value Chi Squared
Please rate your agreement with the following statement: "I worry about patients having pain on nights/weekends when they can't get open pharmacies"?	Q1	Agree	17 (17%)	11 (20%)	
		Somewhat agree	37 (37%)	21 (40%)	
		Do not agree	45 (45%)	21 (40%)	0.39
Please rate your agreement with the following statement: "It is hard for patients to get in to see providers for follow up and opioid prescription refills"?	Q2	Agree	17 (17%)	8 (15%)	
		Somewhat agree	36 (36%)	16 (30%)	
		Do not agree	46 (46%)	29 (55%)	0.79
Please rate your agreement with the following statement "It is easy to e-prescribe so patients don't need extra considerations in rural settings"?	Q3	Agree	30 (30%)	20 (38%)	
		Somewhat agree	33 (33%)	16 (30%)	
		Do not agree	36 (36%)	17 (32%)	0.81
Please rate your agreement with the following statement: "Rural patients have trouble refilling opioid prescriptions because they have to travel long distances?"	Q4	Agree	15 (15%)	4 (8%)	
		Somewhat agree	31 (31%)	19 (36%)	
		Do not agree	53 (53%)	30 (57%)	0.39
Please rate your agreement with the following statement: "It is easier to give more opioids so a patient doesn't have to deal with getting refills if needed for pain"?	Q5	Agree	14 (14%)	3 (6%)	
		Somewhat agree	14 (14%)	5 (9%)	
		Do not agree	71 (71%)	45 (85%)	0.29
I am more sympathetic to patients with cancer who are in pain than non-cancer patients in pain	Q6	Agree	12 (13%)	7 (14%)	
		Somewhat agree	26 (27%)	13 (25%)	
		Do not agree	56 (60%)	31 (61%)	0.61
Patients with cancer have more pain than other non-cancer patients	Q7	Agree	11 (12%)	2 (4%)	
		Somewhat agree	26 (28%)	16 (32%)	
		Do not agree	57 (60%)	32 (64%)	0.95
I am worried about opioid addiction in my patients with cancer	Q8	Agree	19 (20%)	16 (31%)	
		Somewhat agree	35 (37%)	13 (25%)	
		Do not agree	40 (43%)	22 (43%)	0.38
I am more concerned with saving my patient's life than the possibility of them being addicted to opioids	Q9	Agree	31 (33%)	11 (21%)	
		Somewhat agree	26 (28%)	12 (23%)	
		Do not agree	37 (39%)	29 (56%)	0.12
Practices					
What is your practice towards patients with cancer and prescribing opioid narcotics?	Q10	I give more	19 (20%)	8 (16%)	
		I give the same	52 (55%)	28 (55%)	
		I give fewer	24 (25%)	15 (29%)	0.47
How does your opioid prescribing practice change when you have a patient seeing you who lives in a rural area?	Q11	I give more pills	5 (5%)	5 (9%)	
		I give the same	90 (90%)	45 (85%)	
		I give fewer pills	5 (5%)	3 (6%)	0.17

Table 2: Comparison survey respondents by gender

(p=0.31). Surgeons (50%) and trainees (50%) agreed, relative to APCs (0%), that it is easier to give more opioids so a patient does not have to acquire refills if needed for pain (p=0.03). All groups of providers agreed that it is hard for patients to get in to see providers for opioid refills (p=0.36) (Table 4).

When asked about their practice, 5% of APCs compared to 21% of surgeons and 45% of trainees acknowledged giving more opioid narcotics to patients with cancer than non-cancer patients (p<0.001). Trainees were more likely to report giving more opioids in their practice to cancer patients than APCs or surgeons when accounting for age and gender (surgeon versus trainee aPR=22.14, 95% CI 1.8-28.1) (Table 3).

Providers reported that they either agree or somewhat agree that they are more sympathetic to patients with cancer versus non-cancer patients, surgeons (54%), trainees (100%), and APCs (62%) (p<0.001). Trainees (100%) reported at a higher percentage than either surgeons (64%) or APCs (64%) that cancer patients have the same amount of pain as non-cancer patients (p=0.15). Surgeons (67%), trainees (100%), and APCs (64%) either agreed or somewhat agreed that they are worried about opioid addiction in their patients with cancer (p=0.05). Trainees (59%) and surgeons (43%) appeared more likely than APCs (35%) to acknowledge that they were more concerned about saving their patient's life than the possibility that they could become addicted to opioids (p=0.32) (Table 3).

Discussion

The current study investigates surgical provider perceptions and beliefs about patients with cancer versus non-cancer and patients living in rural versus non-rural areas regarding pain management according to their role and gender.

While there were relatively few differences in agreement regarding patients and opioid prescribing factors according to gender, a more likely explanation is that APCs are more likely to be female (69%) which is

Table 3: Surgeon versus trainee prevalence ratios, adjusted by age and gender

		Male (n=100)	Female (n=53)	Surgeons (n=86)	Trainees (n=31)	APC (n=36)	P value Chi Squared	aPR*	95%CI
What is your practice towards patients with cancer and prescribing opioid narcotics?	I give more	19 (20%)	8 (16%)	12 (21%)	14 (45%)	1 (5%)	p<0.001	22.14	1.8-28.1
	I give the same	52 (55%)	28 (55%)	46 (79%)	17 (55%)	19 (95%)			
	I give fewer	24 (25%)	15 (29%)	0	0	0			
How does your opioid prescribing practice change when you have a patient seeing you who lives in a rural area?	I give more pills	5 (5%)	5 (9%)	4 (5%)	5 (16%)	0	p=0.02	3.9	1.4-38.0
	I give the same	90 (90%)	45 (85%)	76 (95%)	26 (84%)	34 (100%)			
	I give fewer pills	5 (5%)	3 (6%)	0	0	0			

*Adjusted for age and gender.

Table 3: Surgeon versus trainee prevalence ratios, adjusted by age and gender

Table 4: Comparison survey respondents, by role

Attitudes/ perceptions						
			Surgeons (n=86)	Trainees (n=31)	APC (n=36)	P value Chi Squared
Please rate your agreement with the following statement: "I worry about patients having pain on nights/weekends when they can't get open pharmacies"?	Q1	Agree	16 (33%)	6 (19%)	6 (30%)	0.06
		Somewhat agree	30 (63%)	16 (52%)	12 (60%)	
		Do not agree	2 (4%)	9 (29%)	2 (10%)	
Please rate your agreement with the following statement: "It is hard for patients to get in to see providers for follow up and opioid prescription refills"?	Q2	Agree	13 (27%)	8 (38%)	4 (27%)	0.36
		Somewhat agree	32 (67%)	12 (57%)	9 (60%)	
		Do not agree	3 (6%)	1 (5%)	2 (13%)	
Please rate your agreement with the following statement "It is easy to e-prescribe so patients don't need extra considerations in rural settings"?	Q3	Agree	24 (41%)	8 (35%)	18 (56%)	0.09
		Somewhat agree	25 (42%)	13 (57%)	12 (38%)	
		Do not agree	10 (17%)	2 (8%)	2 (6%)	
Please rate your agreement with the following statement: "Rural patients have trouble refilling opioid prescriptions because they have to travel long distances?"	Q4	Agree	12 (29%)	7 (24%)	0	0.31
		Somewhat agree	28 (66%)	11 (38%)	11 (79%)	
		Do not agree	2 (5%)	11 (38%)	3 (21%)	
Please rate your agreement with the following statement: "It is easier to give more opioids so a patient doesn't have to deal with getting refills if needed for pain"?	Q5	Agree	13 (50%)	4 (50%)	0	0.03
		Somewhat agree	11 (42%)	4 (50%)	4 (80%)	
		Do not agree	2 (8%)	0	1 (20%)	
I am more sympathetic to patients with cancer who are in pain than non-cancer patients in pain	Q6	Agree	7 (17%)	7 (32%)	5 (24%)	0.001
		Somewhat agree	16 (38%)	15 (68%)	8 (38%)	
		Do not agree	19 (45%)	0	8 (38%)	
Patients with cancer have more pain than other non-cancer patients	Q7	Agree	6 (14%)	3 (19%)	4 (24%)	0.15
		Somewhat agree	22 (50%)	13 (81%)	7 (41%)	
		Do not agree	16 (36%)	0	6 (35%)	
I am worried about opioid addiction in my patients with cancer	Q8	Agree	16 (25%)	12 (52%)	7 (25%)	0.05
		Somewhat agree	27 (42%)	11 (48%)	11 (39%)	
		Do not agree	21 (33%)	0	10 (36%)	
I am more concerned with saving my patient's life than the possibility of them being addicted to opioids	Q9	Agree	22 (43%)	13 (59%)	8 (35%)	0.32
		Somewhat agree	18 (35%)	7 (32%)	13 (57%)	
		Do not agree	11 (22%)	2 (9%)	2 (8%)	
Practices						
What is your practice towards patients with cancer and prescribing opioid narcotics?	Q10	I give more	12 (21%)	14 (45%)	1 (5%)	0.001
		I give the same	46 (79%)	17 (55%)	19 (95%)	
		I give fewer	0	0	0	
How does your opioid prescribing practice change when you have a patient seeing you who lives in a rural area?	Q11	I give more pills	4 (5%)	5 (16%)	0	0.02
		I give the same	76 (95%)	26 (84%)	34 (100%)	
		I give fewer pills	0	0	0	

Table 4: Comparison survey respondents, by role

same rates of postoperative pain as their other patients, surgeons and trainees more frequently acknowledged giving more opioid narcotics to patients with cancer in this study. While cancer patients in general have both acute and chronic pain due to their underlying diagnosis and subsequent sequelae, from a surgical perspective, the respondents were in line with what is generally accepted that the surgical pain should be the same regardless of cancer morbidity.[18] However, in 2017, Deshields et al. performed a large study with 301 non-cancer patients (NCP) and 558 cancer patients (CP) and found that NCPs had a higher reported rate of pain when compared to CPs (45% of CP versus 54% of NCP).[23] This finding could be due to a higher tolerance for pain from the cancer patient group due to having higher baseline pain due to chronic conditions.[23]

This contrast in practice and belief may represent an area for improvement and advocacy and warrants further study to determine if underlying bias or sympathy for cancer patients is affecting actual prescribing practices.[19] This is similar to other studies that found that cancer patients were more likely to have an opioid prescription than a non-cancer patient and that they are at high risk for opioid misuse.[17, 18, 19]

Throughout the study, trainees reported similarly in their responses to surgeons when compared to APCs. The structure of resident and fellow training by shad

impacting prescribing.

We found that APCs' opioid prescribing practices were less influenced than surgeons or trainees on the rural location of their patients. However, their knowledge and beliefs regarding potential disparities in access to care and pain management faced by rural patients were different by provider type. Half of surgeons and trainees answered that it is easier for them to give more opioids so a patient does not have to acquire refills when compared to APCs (p=0.03). Surgeons, trainees, and APCs also answered that their patients do indeed have difficulty getting in to see them for refills due to long distances (p=0.36). These attitudes and beliefs could potentially impact actual prescribing practices by either overprescribing opioids or the reverse by not meeting patient needs. This is similar to previously reported literature that showed rural patients were more likely to have an opioid prescription than similar cohorts in urban areas.[12]

While surgeons, trainees, and APCs agreed that cancer patients have the

-owing and learning under the close supervision of surgeons in an academic medical center[24] would intrinsically be expected to foster similarities between the two groups. While APCs also receive supervision from the surgeons, their attitudes and perceptions differed more frequently from them then did the trainees. This could also argue that the initial medical education from either medical school for residents and fellows or nurse practitioner and physician assistant school has an important role in facilitating attitudes and perceptions regarding opioid prescribing. In many surgical practices, APCs have taken over the day-to-day management of patients and may therefore be more likely to perceive the importance of pain management for patients. This finding may also tie into the fact that APCs are spending more individual time with the patient due to surgeon time limitations.

The major limitation of our study is that it was done at a single institution. Homogeneity of the institutional culture and commonalities in the health system may limit the generalizability of our findings. We do not anticipate that this single institution was intrinsically different than other institutions. Furthermore, though we had a 92% response rate among female providers, it is still a small sample size. Another limitation is that the survey depended on self-reporting. We were not able to compare provider responses with their actual prescribing practices as the surveys were anonymous to encourage responses. It is possible that providers may be over-estimating their awareness and application of guidelines or other practices they view as socially desirable. Healthcare workers may conform to rules of an institution despite their personal values.[25] However, we attempted to reduce this bias by keeping survey responses anonymous. Furthermore, it is possible that the response rate was substantially higher among those providers who view overprescribing as a serious problem. Other methods such as qualitative interviews or focus groups may be helpful in identifying potential barriers to improvement.

Conclusion

APCs more frequently reported that they gave the same amount of opioids to rural patients that they give to urban patients. However, prescribing providers differed in their attitudes and perceptions about e-prescribing and potential disparities that exist for the rural patient by gender and surgical role. This was also the case for cancer patients in that surgeons gave more opioids to cancer patients despite not reporting that they thought cancer patients have more pain than others. Therefore, in regards to rural and cancer patients and potential disparities, there seems to be an opportunity for improvement and educational interventions based on gender and the role of prescribing providers. This could include more systematic guidelines and identification of rural and cancer populations built into the care pathways can lead to individual level discussion in order to evaluate possible barriers and mitigate risk for these patients.

Acknowledgements

Abbreviations:
APC: Advanced practice clinicians
CP: Cancer patients
NCP: Non-cancer patients

Ethics approval and consent to participate:
This study was approved in accordance with the guidelines and principles of the University of Utah Institutional Review Board and a consent cover letter was utilized. As this was an anonymous survey, documentation of informed consent was not obtained per IRB requirements and approval. It was implied that those who continued with the survey after the consent cover letter gave consent for participation.

Availability of data and material:
Data and material are available upon request.

Competing interests:
There are no competing interests associated with the research presented herein.

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Authors' contributions:
HT, LH, VV, LG, CP crafted the research question, hypothesis, and study design. HT and LH created the survey. HT, LH, VV, LG, and CP collected the data. HT performed the data analysis while LH, VV, LG, and CP provided critical interpretation of the data. HT drafted the manuscript. LH, VV, LG, and CP provided essential revisions to the manuscript. All authors have read and approved the manuscript.

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Mental Health for Latina Youth: The Need for Tailored Resiliency Interventions

Jordan E. Johnson, Lisa H. Gren, and Caren J. Frost
/ University of Utah

Problem Statement

Mental health is a serious issue associated with reduced life satisfaction, shortened life expectancy, and higher rates of physical illnesses.[1,2] Among adolescents, poor mental health significantly impacts long-term health behaviors, such as drug use or sexual behaviors.[3] In the recent Youth Risk Behavior Survey Data Summary and Trends Report for 2019, feelings of hopelessness and sadness increased among adolescents from 2009-2019 by 10%.[4] The mental health and life outcomes of Latina adolescents is of particular concern as they have an increased risk of mental illness due to challenging experiences such as discrimination, violence, language and cultural barriers, academic challenges, and a lack of support.[5,6] It is apparent that current programs and interventions do not meet the health needs of Latina adolescents as adolescent females reported feelings of sadness or hopelessness by almost double the percentage of adolescent males, and 40% of Hispanic students reported these feelings compared to 36% of White students and 32% of Black students.[4] In an attempt to address these challenges and improve mental health outcomes, researchers have implemented several resiliency programs among immigrant and U.S.-born Latina/o adolescents, with the hope that resilience will strengthen their ability to adapt to change and deal successfully with life's challenges.[7] However, these resiliency programs often fail to account for differences in sex and gender (sex referring to biological characteristics and gender referring to personal identification) among Latino and Latina adolescents. This is a potential issue as researchers have found that sex and gender play a significant role in Latina adolescents' future mental and physical health outcomes.[8] Despite the overall success of resilience programs, without gender- and sex-specific research, many programs are likely inadequate in meeting the needs of Latina youth.

Status of Literature

In general, many types of programs exist to help develop and encourage resilience among youth. The first of these focuses on parenting. Studies have shown that effective parenting can prevent long-term adverse outcomes among children in many areas of life, such as substance use, mental health, physical health, and academics. A review of experimental parenting studies found that out of 22 programs reviewed, 20 had a significant impact on long-term outcomes up to 15 years after participation.[9] School-based interventions have also been effective at increasing resilience. One such school program implemented a curriculum to help adolescents identify emotions and the appropriate response to emotions. Results showed that the curriculum was helpful, enhanced support and connection, and destigmatized mental health.[10] Another common resilience intervention is mindfulness training. Mindfulness uses meditation to focus one's mind on the present moment and teaches individuals how to regulate emotions. Researchers implemented one mindfulness program among Asian and Latina/o minority adolescents. Participants were randomized to take a 12-week training course either during the first or second semester of school. Results showed that the program reduced perceived stress, expressive suppression, avoidance and fusion, rumination, internalizing problems, externalizing problems, and attention problems.[11] The last commonly used resilience intervention is a community-based approach. This involves

studying the ecological factors surrounding an individual and responding appropriately to improve overall living conditions.[12] One study found that resiliency programs often overlook structural barriers to resilience, even though understanding these barriers is crucial to the successful development of resilience.[13]

Currently, researchers have tailored only one resilience program to fit Latina youth. This program is known as Positive Youth Development (PYD). PYD emphasizes personal agency and focuses on youths' strengths as a way to confront challenges.[14] Researchers have used PYD to address various challenges faced by Latina youth, such as sexual identity, ethnic discrimination, and incarceration.[15,16] One study showed that PYD effectively strengthened resiliency attitudes and skills such as humor or creativity, measured through the use of the Resiliency Attitudes and Skills Profile (RASP).[16]

Call to Action

Researchers argue that minority females are frequently confronted with experiences of adversity and gender-based discrimination, requiring them to develop resilience.[17] However, much of the literature on resilience among Latina/o adolescents is limited by not considering sex and/or gender differences.[15] This limits the effectiveness of the programs and the subsequent development of resilience for Latina adolescents. Sex- and gender-specific research is needed to explore the impact that existing resilience programs have on Latina adolescents. Health professionals will then be able to refine resilience programs to better serve Latina adolescents. This could significantly improve their future mental and physical health outcomes.[8]

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Extreme Risk Protective Orders and Reducing Intimate Partner Homicides

Sasha Freed and Rachel Coffey
/ University of Utah

Problem Statement

Domestic violence (DV) and intimate partner violence (IPV) range from physical, emotional, sexual, mental, and verbal abuse from either a person in the same domestic household of a person or a person who wants to be intimate with another person. DV and IPV can have lasting consequences on a woman's health, including emotional trauma, lasting physical injuries, and chronic pain, and even death.[1] Statistics show that having guns in a household increases the perpetrator's possibility of using a firearm in their violence towards a victim. Almost half of the adult homicides per year are from DV situations, and often guns are the weapon of choice.[2]

Status of Literature

Utah has had a higher rate of DV compared to national rates. Nationally one in four women will experience DV or IPV in their lifetime, and in Utah, one in three will experience DV or IPV.[2] The repercussions of DV are significant. 42% of adult homicides since 2000 in Utah have been related to DV, children witness 22% of DV homicides, and guns are commonly the weapon of choice for male perpetrators in DV homicide.[2] Understanding these statistics is even more critical today because many people, including Utahns, have been more isolated and at home with abusive partners due to COVID-19. Evans (2020) is calling for additional research around the impact of COVID-19 and increasing DV rates. However, anecdotally, there appears to be higher rates of DV due to many of the COVID-19 restrictions ranging from social distancing, isolation, quarantine, and shelter in place.[3] When we can understand the impact of the COVID-19 and DV, we can provide better services and programs to support victims.

With over 70% of female homicides in Utah being related to domestic violence, concerns about providing more protection for women is an essential part of social policy legislation.[4] Individuals experiencing domestic violence are often at high risk of death by intimate partner homicide. In homes where domestic violence is occurring, the presence of a firearm in the home increases the risk of a woman being murdered by their male intimate partner to 500%.[5] Furthermore, 50% of all intimate partner homicides were committed with a gun, indicating that guns are the primary weapon used in intimate partner homicides.[5]

Call to Action

The Violence Against Women Act (VAWA) addresses individuals convicted of domestic violence and the possession of a firearm, but there is no language about relinquishing firearms.[5] Ultimately, gun ownership is considered a state's right, and Utah's recent legislative session passed H.B. 229, marketing the bill as a suicide prevention act, including specific language about a requirement to relinquish firearms.[6] The law requires that individuals have the option of surrendering firearms to law enforcement when the protective order is served or within 24 hours to a federally licensed firearms dealer.[6] Although this does provide relinquishment language, there is a significant gap of 24 hours where a domestic violence victim could be murdered by their partner before turning their guns in. Furthermore, the law doesn't include specific language for

victims of domestic violence. The best way for concerned community members to support extreme risk protective orders is to reach out to local legislators to make sure Utah's extreme risk protective orders include specific language about relinquishment of firearms in cases of DV and IPV, as well as require that firearms are surrendered only and immediately when the order is served to the respondent. In addition, people in Utah can work with UDVC to ensure that DV and IPV victims can have the protection and safety they deserve especially during the times of national crisis. Such as our current COVID-19 pandemic, when many legal processes and hearings are becoming delayed.

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Female Healthcare Workers' Mental Health During COVID-19 and Available Resources

Heidi Ryan and Lauren Homer
/ University of Utah

Problem Statement

Adverse mental health outcomes are a severe public health issue that significantly affects our healthcare providers' health and performance.[1] Worldwide, female healthcare providers have been physically and emotionally exhausted from caring for COVID-19 patients. Their mental health may be affected by the increased demand for care and the maintenance of personal responsibilities. Additional resources must be made available to care for healthcare providers' mental health during the COVID-19 pandemic.

Status of Literature

Burnout is a familiar syndrome among healthcare providers manifested by symptoms of spiritual and emotional exhaustion, depersonalization, and a decreased sense of personal achievement.[2] Burnout contributes to insomnia, headaches, reduced job satisfaction, and increased mental health problems such as depression and anxiety.[3] Evidence of burnout was reported in 42% of 15,000 US physicians from a 2018 survey, which is associated with an increased risk of significant medical errors.[4]

Women typically have the burden of child and family care, however, family resources were shut down by the pandemic. Mothers and wives in our community who are also our healthcare providers are unfairly affected emotionally and physically by the global pandemic. The global pandemic has demanded much more of our physicians, nurses, and other healthcare providers, contributing to burnout. These challenges include the pressure of reducing the spread of infection, developing suitable short-term and long-term strategies and plans, continuing to treat non-COVID patients successfully, and maintaining personal and family responsibilities.[5] Healthcare providers report more distress about family contracting COVID-19 or unknowingly infecting others than acquiring themselves.[6] These conditions for our female health care workers are exasperated by the lack of or ineffectiveness of available resources.

Research indicates that female health care workers are at increased risk for mental health problems during the current COVID-19 pandemic.[7] The recent literature has demonstrated a higher risk for anxiety, depression, and greater fear in medical staff with direct contact with COVID-19 patients.[5] Healthcare providers on the frontlines of COVID-19 (i.e., emergency department, intensive care, and infectious disease units) are at greater risk for psychological disorders.[8,9] Older healthcare providers have demonstrated increased stress related to a lack of personal protective equipment and longer work hours.[10] Additionally, women and individuals in high-risk areas may have more negative psychological health outcomes.[11] A study concluded that more attention needs to be given to female nursing staff's mental health between the ages of 30-39.[12]

Call to Action

Female healthcare providers working on the front lines during the COVID-19 pandemic have been overwhelmed with providing care for the public. During our current COVID-19 pandemic or any future national crisis, our female healthcare providers should be aware of the available resources and aid offered by their

employer and others within the community. As an interdisciplinary team of social work and public health, we offer the following information in hopes of informing healthcare providers of available relief and ameliorate stress.

Intermountain Healthcare (IHC) provided mental health counseling for physicians and an employee assistance hotline with other resources and help for all employees.[13] IHC also offered clean scrubs for their physicians to wear home after a shift to avoid the risk of infecting family members; however, this service was not offered to nurses and MAs. As the provision of clean scrubs and PPE may have relieved stress and anxiety, we believe in the inclusion of all employees to receive clean scrubs. In addition, IHC offered "COVID" pay up to 2 weeks for employees who became infected with COVID-19 or had to self-quarantine.

The following resources were offered on the IHC website (2020), under the headings "Caregiver Resources for COVID-19," "COVID Related Caregiver Discounts," and "Employee Assistance Program" and were available for all healthcare providers who are giving care during the global pandemic.[14,15]

Nevertheless, it is unknown how well these resources are publicized to and utilized by employees. We propose increased emphasis and advertisement on mental health resources available to aid those that are risking their physical and mental health to care for others. Additionally, increased monetary compensation or PTO may be beneficial in improving job satisfaction and mental health among healthcare providers. Aside from health measures, our best defense against COVID-19 is providing optimal conditions and comprehensive resources for our healthcare providers.

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Obesity and Mental Health

Eliza Taylor, Alek Bak, and Piper Moore
/ University of Utah

Problem Statement

The prevalence of obesity in the United States has increased from 30.5% to 42.4% among adults over the past twenty years.[1] Although obesity has an impact on health regardless of gender, some disparities exist. Rates of obesity are similar among men and women; however, stroke risk associated with obesity has remained stagnant in men and increased three-fold in women since the year 2000.[2] In a sample of 682 people with comorbid binge-eating disorder and obesity, women had significantly higher eating disorder psychopathology than men.[3] This suggests that obesity in women may have a psychological manifestation that varies from that of men. In a systematic review of the link between adverse life experiences and obesity and binge-eating, 85% of available studies found a positive association between trauma and obesity, and 90% of the studies found a positive association between trauma and binge-eating disorder.[4] Yet, the Centers for Disease Control and Prevention (CDC) guidelines for weight loss and obesity prevention include nutrition and exercise strategies but make no mention of psychological interventions to address obesity.[5] Why aren't we addressing the psychological component of obesity?

Status of Literature

Recent literature confirms previous research that those with obesity are, in fact, at higher risk of experiencing eating disorders. To improve the care provided to those with obesity, a greater exchange of experiences and specialized knowledge between healthcare professionals working in the obesity field and those working in the field of eating disorders is needed.[6] In 2018, a team of researchers set out to examine the role stress management/mental health coaching plays in the treatment of obesity.[7] Two groups underwent a weight loss program at an obesity clinic. One group received stress management courses in addition to the weight loss program. At the end of eight weeks, the group who received stress management exhibited greater weight loss and decreased depression and anxiety. As more information is discovered about the benefits of psychological treatment for obesity, various forms of psychological treatment are being examined. In 2017, another team of researchers found Cognitive Behavior Therapy for individuals with obesity to be effective and a preferred method for obesity treatment.[8]

Currently, the COVID-19 pandemic is having negative impacts on weight gain and eating disorders. Researchers are seeing that many individuals are gaining weight as a result of the COVID-19 pandemic.[9] In addition to weight gain, COVID-19 has negatively impacted those with eating disorders. Studies show that those with bulimia nervosa and binge-eating disorders reported experiencing more episodes of binge eating and more compulsion to binge eat.[10] We expect to see this COVID-19 increase in obesity and eating disorders proportionally higher in women compared to men. With the obesity and mental health link ever-present, we are in urgent need of obesity healthcare reform.

Call to Action

A recent review of current treatments for obesity include lifestyle changes in diet and exercise, pharmacotherapeutic interventions, and surgical interventions as the primary treatment options.[11] None of these inter-

-ventions explicitly address psychological barriers to care associated with obesity. Not only in the wake of COVID-19 but with the perpetrating growth of the obesity epidemic, emerging studies reflecting the importance of incorporating psychological treatments in current weight loss programs need to be implemented. To better address the obesity epidemic, more research needs to be conducted related to understanding and treating the psychological aspects of obesity, including its comorbidity with binge eating disorder and its correlation with experiences of trauma.

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The Impact of Socioeconomic Status on Women's Physical Health

Diana K. Powell, Cody A. Lockyer, and Jessica G. Broadbent
/ University of Utah

Problem Statement

The relationship between socioeconomic status (SES) and women's physical health warrants further study, particularly through a social work lens. SES is determined by more than income; SES is also influenced by one's level of education, individual perceptions of social standings, and overall financial security. A lower SES increases the likelihood that one will develop physical and mental health issues over the course of the lifetime.[1] With low SES influencing women's education and social standings, the increased risk warrants further research into the impacts these detriments have on women specifically through a social work lens.

Women are already at greater risk for experiencing various forms of systemic and institutional discrimination. Wang and Geng (2019) found that those with a low SES are more likely to experience a decline in exercise and quality of sleep, and an increase in substance use.[2] Kivimäki et al. (2020) suggest that numerous unhealthy lifestyle choices are related to socioeconomic disadvantage.[1] Further, lower SES is correlated with poor self-reported health outcomes and lower life expectancies.[3] While these findings are not exclusive to women, low SES is one of many compounding factors that are detrimental to a woman's health and wellbeing. Social work is hallmarked by a commitment to promoting the wellbeing of all people with an emphasis on marginalized populations. Additional research on the relationship between women's physical health and SES could open new pathways for further study, advocacy, and service implementation within the range of social work contexts.

Status of Literature

The literature on the impacts of socioeconomic status on women's physical health is fairly extensive; however, there is a dearth of articles exploring direct implications for social work practice. Lower SES and the experience of poverty are major factors influencing physical health outcomes for women. Lower income and wage inequality can contribute to a multitude of negative physical health outcomes for women, sometimes even leading to premature death.[4] The interrelated, cyclical nature of lower SES, less education, poverty, and various health issues is largely overlooked in literature when examining the impacts on women specifically. Income disparities based on gender continue to exist in the United States. Such disparities create further difficulties for women seeking access to resources and services that promote their physical wellbeing. Women belonging to marginalized populations experience the compounded effects of various institutional, systemic, and cultural barriers. Many of the resources and forms of assistance that individuals of low SES seek are rendered necessary because of the barriers imposed by poverty itself. Additionally, lower SES and poverty often create interpersonal challenges for women which also impact physical health.

Interpersonal violence (IPV) and abuse have major impacts on women's overall physical health. Rates of IPV are higher among minoritized, undocumented, and lower SES women, posing a major risk to their physical health. Physically abusive relationships often impact women's daily functioning due to increased rates of broken bones, diseases, chronic disorders, and gynecological problems. In addition to these risks, women experiencing IPV and abuse are at increased risk of

substance abuse or becoming suicidal.[5] Exploring the connections between SES, IPV, and physical health in women in the context of social work practice holds the potential for vast improvements in service delivery and subsequent outcomes.

Call to Action

Social workers serve many clients of low SES across various populations. It is critical that social workers recognize the profound impacts of low SES on women's physical health. Promoting and engaging in evidence-informed practice and practice-informed research are ethical responsibilities integral to good social work practice. Doing so is essential for the betterment of those seeking direct services and, subsequently, wider society.

Continued research into the relationship between women's socioeconomic status, poverty, and physical health will allow for increased understanding and improved quality of care. East & Roll (2015) recommend that social workers in clinical and community settings better recognize how gender-based inequalities impact the women they work with;[6] however, additional research into the larger impacts that low SES has on women's physical health and overall wellbeing can benefit all those who work with women and their loved ones. Understanding systemic barriers that women face allows social workers, and other professionals, to operate more efficiently in their work on the micro, mezzo, and macro levels. Additional research on the connection between women's physical health and SES through the lens of social work practice will benefit clients and professionals alike.

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Hidden Women: Unmet Medical Needs of Utah's Incarcerated Women

Cami Fuhriman, Kysha Hill, and Arielle Martin
/ University of Utah

Problem Statement

In this commentary we will outline the unique health needs of Utah's imprisoned female population, including the need to address cervical and breast cancer, age-related illness, substance abuse, and heart disease.

We highlight that incarcerated women experience higher rates of substance abuse, physical and sexual assault, and trauma than their non-incarcerated counterparts, leading to a greater need for specialized medical attention.

We will outline how Utah's above-average rates of imprisoned women require more specialized and preventative healthcare. We further argue for greater research and advocacy for this marginalized population, which is hidden from the public eye. We use the seven domains of women's health as a framework to argue for a whole-health approach to the overall wellness for this population.

Status of Literature

The rates of incarcerated women across the United States are vast when compared to other developed nations. Currently the United States "lock[s] women up at rates that are at least 5 times the rates of our closest international allies."[1] The rate of women in prisons across the country is growing faster than that of imprisoned men.[2] The current system was built for men and falls short in addressing women's unique biological and psychosocial needs.

The population in U.S. women's prison is overwhelmingly made up of nonviolent drug offenders. The complex nature of women's experiences of trauma creates a unique and desperate need for tailored interventions that address the overall health of this population.[3] Women who are or have been incarcerated are less likely to have medical insurance, preventative healthcare, financial resources, and have lower levels of education.[4] Marginalized groups such as incarcerated women, of whom many also belong to a racial minority, experience higher rates of oppression that lead to worse health outcomes,[5] including chronic illness and infectious diseases.[6]

Women who are incarcerated are four to five times more likely to have cervical cancer compared to women without criminal histories. Although more research must be done, some studies suggest that imprisoned women are also several times more vulnerable to mortality due to cervical cancer.[7] Research has shown that one contributing factor to the increased cervical cancer risk is low health literacy. Ramaswamy implemented brief but effective education interventions that improved health literacy. Education is intended to supplement advocacy, prevention services including cancer screenings, and resources for health insurance as women re-enter their communities.[4]

"The limited studies evaluating the health of older female inmates indicate that, like older male inmates, older female inmates are generally sicker than their non-incarcerated counterparts."[8] Female inmates over 55 have higher rates of hypertension, arthritis, and respiratory disease compared to non-imprisoned women over 65. Older women inmates also have higher rates of chronic illness than their male counterparts.[8]

Call to Action

Little progress has been made in changing legislation to increase incarcerated women's access to medical care. In 2019, Utah lawmakers passed a bill to ban shackling inmates during birth and allocated funds for reproductive health education for incarcerated women.[9] We could find no Utah law or code that dictated regular preventative screening methods for cervical cancer or other conditions that affect women over the lifespan. The Utah Prisoner Advocate Network reported that "hormones and gynecological attention [are] reported to be offered for women's concerns in Draper at the Wasatch Infirmary.[10] There were no other mentions of required preventative procedures or screening except for when an inmate is first admitted to the facility.

The limited demographic data for Utah's incarcerated women's population presents a barrier to providing appropriate healthcare resources. Without detailed data, it is difficult to understand the full scope of health issues imprisoned women face. More research and information are required to implement evidence-based interventions. It is important to recognize how the seven domains of health—physical, social, financial, environmental, intellectual, spiritual, mental—are intertwined for this marginalized population.[11] Better, more complete demographic data are needed to motivate legislation changes to meet the unique needs of female inmates in Utah.

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Exploring the Differences in Sleep Quality for Pre-Menopausal Women

Ayanna Morazan
/ **University of Utah**

Problem Statement

Sleep is an important consideration in a woman's health: sleep disorders are associated with poor physical and mental health outcomes, including depression, anxiety, hypertension, cardiovascular disease, and glucose dysregulation,[1] and sleep also affects mood and brain cognition, including memory, decision making, sustained attention, and motor control.[2] Compared to men, women experience a 40 percent increased risk in developing insomnia, and they report more sleepiness than men.[3] Women's sleep is affected by hormonal changes during menses, pregnancy, and menopause; social and environmental factors; and roles within the family. Healthcare and social work fields should address these unique challenges. With an 8:1 ratio of men to women observed in sleep centers,[3] sleep in women is significantly understudied.

Status of Literature

Della Monica et al. (2018) measured Rapid Eye Movement (REM) sleep in both men and women.[2] The authors found that women have more sleep complaints and lower self-reported sleep scores, and they also experience higher levels of slow wave sleep (SWA) than men. This difference in subjective and objective sleep reports between men and women may be explained by a combination of social and cultural differences as well as biological and hormonal differences. More women are primary caregivers in their families than men, and women also constitute half of the workforce, which places considerable demands on women's time.[3] Women also experience higher levels of chronic conditions, such as overactive bladder, fibromyalgia, and chronic pain, which often cause a decrease in physical activity and poor sleep outcomes, but more research is needed to explore these connections.[3]

Women are particularly at risk for disrupted sleep during pregnancy and postpartum, which increases risk for poor mental health outcomes. For premenopausal women, poor sleep is linked to adverse reproductive health outcomes, such as menstrual irregularities, increased miscarriages, and lower birth rates.[1] Richter et al. (2019) found that new mothers, especially first-time mothers, experienced worse sleep than new fathers, although fathers also reported a decrease in sleep quality.[4] Sleep quality decreased for about three months postpartum, at which point sleep quality and duration often started to increase in quality and duration without, however, fully recovering even six years after giving birth.[4] The study also found that breastfeeding is related to decreased sleep quality, yet this finding is inconsistent with past studies that reported no difference between breastfeeding or non-breastfeeding mothers. Regardless, becoming a parent is likely the most significant sleep-altering event for an individual and a major contribution to the overall decrease in sleep quality in adulthood.[4]

Social factors such as age, socioeconomic status, and dual vs. single parenting may affect sleep outcomes for pregnant or postpartum women. However, in the study conducted by Richter et al. (2019), there were no significant differences between wealthy, older mothers from a dual parenting home and their less wealthy, younger counterparts who were single parents.[4]

Call to Action

Sleep affects many aspects of health, including physical, mental, and social health, and should be addressed by social workers with their clients. Lack of sleep can significantly impact a woman's life and her dual roles in the workforce and as a caregiver in her family.[3] For social workers, it is especially important to address sleep with new mothers. This can include education on how sleep can affect physical and mental health during pregnancy and postpartum, discussing ways to improve sleep, and developing realistic expectations for sleep.

While Richter et al. (2019) found that new mothers' sleep will be affected regardless of socioeconomic status, age, and dual vs. single parenting, social workers should still emphasize resources to increase social and economic support.[4] More broadly, we need additional research especially for sleep disorders among women and on the discrepancies between subjective and objective sleep outcomes, as sleep in women has historically been under-researched.

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