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Disparities in Adverse Preconception Risk Factors between Women with and without Disabilities

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Abstract

Objective—The objective of this study was to compare the prevalence of select preconception health indicators among women with and without disabilities.

Methods—2010 Behavioral Risk Factor Surveillance System data were used to estimate the prevalence of health behaviors, health status indicators, and preventive health care among non-pregnant women ages 18–44 years with (N=8,370) and without (N=48,036) disabilities. Crude percentages were compared with chi-square statistics. Multivariable logistic regressions adjusted for socio-demographic factors.

Results—Women with disabilities were more likely than women without disabilities to currently smoke (30.5% vs. 14.5%, $p<0.0001$) and less likely to exercise in the past month (67.1% vs. 79.8%, $p<0.0001$). Heavy drinking was similar in the two groups (4.4% vs. 4.5%, $p=0.9$). Health status indicators were worse among women with disabilities, with 35.0% reporting fair/poor health and 12.4% reporting diabetes, compared with 6.7% and 5.6%, respectively, among women with no disabilities ($p<0.0001$ for both). Frequent mental distress, obesity, asthma, and lack of emotional support were also higher among women with disabilities compared with their non-disabled counterparts. Women with disabilities were more likely to receive some types of preventive care, (HIV), but less likely to receive others (recent dental cleaning, routine checkup). Disparities in

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DISCLOSURE

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health behaviors and health status indicators between the two groups remained after adjusting for socio-demographic factors.

Conclusions—Women with disabilities at reproductive age are more vulnerable to risk factors associated with adverse pregnancy outcomes compared to their counterparts without disabilities. Our findings highlight the need for preconception health care for women with disabilities.

Keywords

preconception health; pregnancy; women with disabilities; prenatal care

Introduction

Approximately 11.7% of women of reproductive age report a disability (1) and 2% of women with chronic physical disabilities are currently pregnant (2). Pregnant women with disabilities are at a greater risk for poor health, medical complications and adverse birth outcomes compared to women without disabilities (1, 3–5). Mitra et al. found pregnant women with disabilities were nearly twice as likely to smoke during pregnancy compared with nondisabled women (6). They were also more likely to report experiencing depression before, during, and right after their pregnancy (7). Women with intellectual and developmental disabilities are at greater risk of smoking during pregnancy, experiencing pregnancy complications, and having adverse birth outcomes compared to women in the general population (8–11).

While research suggests elevated risks among women with disabilities during the perinatal period, to our knowledge there are no studies examining the health of women with disabilities during the preconception period. Optimizing preconception health is vital for women of childbearing age, as better preconception health is linked to improved maternal and infant outcomes (12, 13). *Preconception health* refers to the health of women and men during their reproductive years, the years during which they can have a child (14). Preconception health indicators include modifiable risk factors such as, smoking, alcohol abuse, lack of exercise, chronic disease, mental distress and social and emotional support associated with adverse pregnancy outcomes (15–22). Despite the research on the health status of women with disabilities, the disparity in preconception health indicators between women with and without disabilities of reproductive age has yet to be explored. In this paper we have used the *Healthy People 2020* definition of a health disparity as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage” and which adversely affect groups of people who have systematically experienced greater obstacles to health including people with disabilities (23). Better understanding of the disability-related disparities in factors related to perinatal health and pregnancy outcomes will lead to improved care around the time of pregnancy for women with disabilities and improved outcomes for both mother and infant.

To address some of these gaps in research, this study used data from the Behavioral Risk Factor Surveillance System (BRFSS) to compare the prevalence of selected, potentially-modifiable preconception risk factors relating to health risk behaviors, health status, and preventive care, among non-pregnant women of childbearing age with and without

disabilities. This study is the first, to our knowledge, that uses national population-based data to compare the preconception health indicators among women with disabilities to women without disabilities. Based on findings from earlier studies, we hypothesized that women with disabilities in the United States would have a greater likelihood of reporting risk factors associated with adverse birth outcomes.

Methods

Data Source

The BRFSS is an ongoing random digit dial telephone survey of the non-institutionalized US adult population ages 18 years and older. The survey is conducted by the health department in each state, in collaboration with the Centers for Disease Control and Prevention (CDC), to assess health risk behaviors and preventive health practices related primarily to chronic disease and injury (24). Our analysis was conducted with data from the 2010 survey. The sample included women ages 18–44 years in all 50 states, District of Columbia, and 3 territories, who reported not being pregnant at the time of the interview and not having had a hysterectomy (N=56,406). The median survey response rate in 2010 for all states was 54.6% (range: 39.1%–68.8%) (25).

Measures

Respondents were classified as having a disability if they reported either: 1) being limited in any way in any activities because of physical, mental, or emotional problems; or 2) having any health problem that requires the use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone. Demographic and socio-demographic characteristics that were examined include age (18–24 years/25–34 years/35–44 years), education (less than high school/high school/some college/four years of college or higher) race/ethnicity (White, non-Hispanic (NH)/Black, NH/Hispanic/Other, NH/Multi, NH), marital status (married/divorced, separated/widowed/never married/living with partner), employment status (employed/unemployed/homemaker/student, retired/unable to work), and health insurance status (yes/no).

The preconception health indicators were selected from a list of 45 variables that were developed as core state preconception health indicators by Core State Preconception Health Indicators Working Group (19). The BRFSS includes 17 of the 45 indicators. In this study we examined the 14 risk factors that are modifiable and that were included in the 2010 BRFSS. The indicators examined in the study included health risk behaviors, health status indicators, and measures of preventive care. Health risk behaviors related to smoking, exercise, and alcohol use. Women were classified as current smokers if they smoked at least 100 cigarettes during their lifetime and were currently smoking cigarettes every day or on some days (26). Women were classified as engaging in exercise in the past month if they reported participating in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise, other than their job, during the past month (27). Heavy drinking for women was defined as consuming on average more than one drink per day during the past 30 days (28).

Health status variables pertaining to general health, mental distress, social support and chronic conditions were included in the analysis. Women were classified as having fair or poor health based on their response to the question: “In general, would you say your health was: excellent, very good, good, fair or poor?” Diabetes status was based on the response to the question: “Have you ever been told by a doctor that you have diabetes?” Women who reported ‘yes’ or “pre-diabetes/borderline diabetes” were defined as having diabetes. All women who were told they had diabetes whether or not they were pregnant at the time of diagnosis were included. Frequent mental distress was defined as self-report of having 14 days or more during which the respondent’s mental health was not good. Obesity was defined as having a body mass index greater than or equal to 30 ($BMI = \text{weight (in kilograms)}/\text{height}^2 \text{ (in square meters)}$). Women were classified as ever having had asthma if they answered yes to the question, “Have you ever been told by a doctor, nurse, or other health professional that you had asthma?” Women were classified as having adequate social support if they reported always or usually receiving the social and emotional support they need.

Preventive health variables included items related to HIV and Pap testing, dental and medical visits, and vaccination. Ever received HIV test, received Pap test in the past three years, and influenza vaccine within the past year, were obtained from survey items. Recent dental cleaning was defined as self-report of having teeth cleaned by a dentist or dental hygienist within the past year. Women were classified as having a checkup in the past year if they reported “within the past year” to the question “About how long has it been since you last visited a doctor for a routine checkup?”

Statistical Analysis

Prevalence and 95% confidence intervals (CI) for each of the selected risk factors were calculated among respondents with and without disabilities. Between-group differences were tested with a chi-square test. Adjusted prevalence ratios (aPRs), estimated from logistic regression models, were used to assess the association between disability status and selected risk factors, controlling for age, race/ethnicity, education, marital status, employment, and insurance. In addition to the analysis in the overall sample, analyses were performed in the sub-sample of women who reported that they intended to become pregnant in the next five years (29). SAS Software (version 9.3) and SUDAAN (version 11.0.0) were used to account for the complex sampling design and to calculate accurate variance estimates in this study.

This study has been approved by University of Massachusetts Medical School Institutional Review Board.

Results

Demographic Characteristics

In 2010 13.7% of non-pregnant women between 18–44 years of age in the United States reported having a disability. Women with disabilities were older, more likely to be White, non-Hispanic and had lower levels of education and were less likely to be of Hispanic

ethnicity, married, employed, or have health insurance compared with women with no disabilities (Table 2).

Risk Factors

Table 3 presents risk factors for adverse pregnancy outcomes among women with and without disabilities. Over 30% of women with a disability reported currently smoking, twice the percentage reported among women with no disabilities. Two-thirds of women with disabilities reported engaging in exercise in the past month, compared with nearly 80% of women with no disabilities. No differences in heavy drinking behaviors in the two groups were found. Women with disabilities were more likely to report poorer health on all of the health status indicators. The greatest disparities were an over five-fold higher prevalence in self-report of fair or poor health and nearly four-fold higher prevalence of frequent mental distress. While women with disabilities were less likely to report receiving a dental cleaning or checkup in the past year compared with their non-disabled counterparts, women with disabilities were slightly more likely to have ever received an HIV test and to have received a Pap test in the past three years compared to women with no disabilities, and there was no difference in influenza vaccination in the past year between the two groups.

Disparities in health behaviors and health status remained after adjusting for age, race/ethnicity, education, marital status, employment and insurance status. Women with disabilities had a 50% higher adjusted prevalence of smoking compared to women with no disabilities. This group was nearly four times as likely to report fair or poor health and nearly three times as likely to report frequent mental distress compared with non-disabled peers. Women with disabilities also had an increased prevalence of chronic conditions, including an 80% increased prevalence of diabetes, 40% increased prevalence of obesity, and a 90% increased prevalence of asthma. In adjusted analyses, women with disabilities were slightly less likely to receive a dental cleaning, and slightly more likely to receive an HIV test compared with women with no disabilities (Table 3).

In the analysis limited to women intending pregnancy in the next five years the associations observed in the overall sample between the preconception risk factors and disability status mostly remained significant (data not shown), except for ‘exercise in the past month’, diabetes and HIV test. These risk factors were not statistically significant but the effects remained consistent. In the sub-sample analysis, the sample size was reduced to 1,728 from 56,406 due to only 5 states having the ‘intending pregnancy’ question answered.

Discussion

To our knowledge this study is the first examining the preconception health of women with disabilities in the United States. Findings from this study suggest that US women of reproductive age with self-reported disabilities are more vulnerable to multiple risk factors associated with poor pregnancy outcomes. In contrast to other women, women of childbearing age who reported a disability were more likely to report fair or poor health, frequent mental distress, and less emotional support. They were less likely to exercise and more likely to be obese, smoke in the past month, and report chronic diseases such as

asthma and diabetes. A similar association between poor preconception health indicators and disability status was observed among women who intended pregnancy in the next five years.

Women with disabilities have been characterized as having a “thinner margin of health”, that is, being more at risk for chronic conditions, depression, obesity, risk behaviors such as smoking, and facing significant social and economic barriers such as lower levels of education, employment, and earnings, compared to women without disabilities (30–41). In addition, pregnant women with disabilities are more vulnerable to pregnancy complications and adverse maternal and birth outcomes (1, 3–5, 8–11). In the context of the findings from this and earlier studies, gaining an understanding of the pathways through which women with disabilities are at risk of adverse pregnancy outcomes is a prerequisite for providing optimal perinatal care for this population. While a women’s musculoskeletal, metabolic, or other systemic manifestation of a specific disability may directly affect pregnancy and childbirth risks, our results suggest that in addition, a pathway through which disability leads to adverse pregnancy outcomes may be through disparities in preconception health risk factors.

Recognition is growing that birth outcomes reflect the lifetime health history of the mother and that measures to improve the health and wellbeing of the mother needs to begin in childhood (42, 43). The goal of preconception health education and services is to identify risk factors that may impact a future pregnancy outcome, identify women who are at risk and to provide supports and services to help women mitigate these risks prior to conception. Given the disparities in preconception health between women with and without disabilities as documented in this paper, critical steps need to be taken to eliminate these disability-related disparities in preconception health. Strategies to eliminate these health disparities need to address the physical, attitudinal, programmatic, and communication barriers faced by women with disabilities. In addition, these strategies need a life course perspective to tackle the cumulative effects of the structural barriers and disability-related stigma faced by women with disabilities (42).

An important strategy towards eliminating disability-related disparities in preconception health is through the inclusion of women with disabilities in broader maternal and child health policies and programs. The existence of women with disabilities as a population needing maternal health services has not been explicitly recognized. For example, maternal health academic programs and courses rarely examine the health needs of women with disabilities (44). As a result few maternal and child health practitioners have the training to consider the needs of women with disabilities and target and include women with disabilities in public health programs. Considering the significant disparities in the health of reproductive-age women with disabilities, there needs to be an explicit inclusion of women with disabilities in maternal and child health program, policies and education.

The 2006 national recommendations to improve preconception health of women in the United States included monitoring improvements in preconception health by maximizing public health surveillance (12). The 45 core state comprehensive preconception health indicators identified rely on Pregnancy Risk Assessment Monitoring System (PRAMS) and the BRFSS as primary data sources (45). Despite Section 4302 of the Affordable Care Act

which established a set of six questions as the standard for measuring disability in population health surveys, the inclusion of women with disabilities as a “special population” in the CDC preconception care recommendations, the disparities in preconception health of women with disabilities and their risk for adverse pregnancy outcomes, the PRAMS surveys do not include the comprehensive set of questions that identify disability. In order to systematically monitor behaviors, experiences and conditions before, during and after pregnancy including the 45 core preconception health indicators among women with disabilities in the United States, the inclusion of standard of set disability questions in the PRAMS survey is critical.

Finally the results of this study highlight the critical need of developing and disseminating evidence-based interventions targeting the risky health behaviors and the preventable health conditions among women with disabilities. While there has been a significant effort in the last decade to develop evidence-based health promotion programs for people with disabilities, including women, the efforts are still in their infancy (46). In addition to health promotion programs to eliminate health and health care disparities, the education of health care professionals about the needs and risk profile of women with disabilities considering pregnancy is imperative. Women with physical disabilities often report that health care professionals possess negative stereotypes about the sexuality of women with disabilities (47). They are often considered asexual and therefore not in need of information about reproductive health and sexual health information or regular gynecological exams (48–56). These stereotypes are often accompanied by clinicians’ disapproval of women with physical disabilities considering pregnancy and childbearing and doubts about their ability to bear and raise children (57, 58). Therefore a critical step to providing comprehensive preconception counseling to women with disabilities is to change the knowledge and attitudes of health care professionals regarding the reproductive rights of women with disabilities.

Limitations

Our results are subject to several limitations, including several inherent to the BRFSS data. Data are self-report and subject to over-reporting socially desirable behaviors and under-reporting less desirable behaviors. The low response rate may induce selection bias if the relationship between risk factors and disability status is different in non-responders. BRFSS samples community dwelling individuals only and therefore does not include individuals living in institutional settings who may be more likely to have a disability than individuals living in the community. Moreover, due to the limited accessibility of the BRFSS survey, individuals with sensory or cognitive disabilities may not be represented in the survey.

The BRFSS survey items used to define disability do not distinguish between types of disability or assess the severity of disability. Persons with disabilities are heterogeneous and include a wide range of physical, cognitive, and psychiatric conditions. However due to the limitations in the questions used to identify disabilities in the BRFSS, we were unable to identify respondents’ disabling conditions. Moreover, we were unable to determine whether the increased frequent mental distress was limited to women with a psychiatric disability. Similarly the causal relationships between the other chronic conditions such as obesity and

asthma and disability cannot be determined in this study. Future studies need to examine the prevalence of preconception risk factors among women with specific disabling conditions.

Conclusion

Despite these limitations, findings from this study suggest that women with disabilities in the United States are more vulnerable to preconception risk factors associated with adverse pregnancy outcomes. Given the increasing number of women with disabilities who are choosing to become pregnant and bear children and the findings from this study, improving preconception outreach and counseling to women with disabilities, changing perceptions of health care professionals regarding the reproductive rights of women with disabilities, and developing evidence-based health promotion programs that address the preconception needs of women with disabilities are critically important. Finally additional research on the barriers to preconception counseling and consequences of preconception risk factors among women with disabilities is essential.

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Table 1

Summary of Preconception Indicators

Preconception Indicator	BRFSS Question
Health behaviors	
Current smoking ¹	Have you smoked at least 100 cigarettes in your entire life? Do you now smoke cigarettes every day, some days, or not at all?
Exercise in past month	During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?
Heavy drinking ¹	During the past 30 days, have you had at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor? During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage?
Health Status	
Fair or Poor Health	In general, would you say your health was: excellent, very good, good, fair or poor
Diabetes	Have you ever been told by a doctor that you have diabetes?
Frequent Mental Distress	Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?
Obesity ¹	A body mass index greater than or equal to 30 (BMI = weight (in kilograms)/height ² (in square meters)).
Asthma	Have you ever been told by a doctor, nurse, or other health professional that you had asthma?
Adequate Social Support	How often do you get the social and emotional support you need?
Preventive Health Care	
HIV test ever	Have you ever been tested for HIV? Do not count tests you may have had as part of a blood donation. Include testing fluid from your mouth.
Pap test in past three years ¹	A Pap test is a test for cancer of the cervix. Have you ever had a Pap test? How long has it been since you had your last Pap test?
Routine checkup in the past year	During the past 12 months, how many times did you see a doctor, nurse, or other health professional for a routine checkup for your asthma?
Dental check up in the past year	How long has it been since you last visited a dentist or a dental clinic for any reason? Include visits to dental specialists, such as orthodontists.
Influenza shot in past year	A flu shot is an influenza vaccine injected into your arm. During the past 12 months, have you had a seasonal flu shot?

¹Calculated variables

Table 2

Demographic Characteristics of Non-pregnant Women with and without Disabilities Ages 18–44, BRFSS 2010

	Unweighted Number	Disability (n=8,370) % (95% CI)	No Disability (n=48,036) % (95% CI)
Age			
18–24	6,152	17.6 (16.0–19.4)	20.6 (19.9–21.4)
25–34	19,429	33.3 (31.5–35.0)	36.6 (35.9–37.3)
35–44	30,825	49.1 (47.2–51.0)	42.8 (42.0–43.5)
Education			
Less than high school	4,524	12.3 (11.1–13.6)	8.8 (8.3–9.2)
High school	13,034	26.6 (25.0–28.3)	22.8 (22.2–23.5)
Some college	16,115	32.7 (30.9–34.5)	28.3 (27.6–29.0)
At least college graduate	22,666	28.4 (26.8–30.1)	40.1 (39.4–40.9)
Race/ethnicity			
White, NH	37,818	65.9 (64.0–67.7)	61.2 (60.4–62.0)
Black, NH	6,454	12.4 (11.2–13.7)	11.5 (11.0–12.0)
Hispanic	7,391	14.5 (13.1–16.1)	19.2 (18.5–19.9)
Other, NH	3,067	3.9 (3.1–4.7)	6.3 (5.9–6.8)
Multi, NH	1,213	3.3 (2.7–4.0)	1.8 (1.6–2.0)
Marital status			
Married	32,752	46.5 (44.7–48.4)	58.1 (57.3–58.9)
Divorced	5,047	11.0 (10.0–12.1)	5.2 (5.0–5.5)
Widowed	498	0.7 (0.5–1.0)	0.5 (0.4–0.5)
Separated	2,025	4.4 (3.8–5.0)	2.6 (2.4–2.9)
Never married	13,405	31.1 (29.3–32.9)	28.4 (27.6–29.1)
Unmarried couple	2,541	6.3 (5.5–7.2)	5.2 (4.9–5.6)
Employment			
Employed	36,280	44.0 (42.2–45.9)	62.3 (61.6–63.1)
Unemployed	4,802	15.1 (13.7–16.6)	8.7 (8.2–9.1)
Homemaker	9,409	13.9 (12.7–15.2)	17.6 (17.1–18.2)
Student	3,599	9.4 (8.2–10.6)	10.5 (9.9–11.1)
Retired	78	0.6 (0.4–1.0)	0.1 (0.1–0.1)
Unable to work	2,069	17.1 (15.8–18.4)	0.8 (0.6–0.9)
Insurance			
Yes	45,784	77.4 (75.7–79.0)	80.5 (79.9–81.2)
No	10,458	22.6 (21.0–24.3)	19.5 (18.9–20.1)

Table 3

Prevalence of Selected Preconception Risk Factors, reported among non-pregnant women Ages 18–44, by Disability Status, BRFSS 2010

	Disability (n=8,370)	No disability (n=48,036)	Disability
	% (95% CI)	% (95% CI)	aPR^a (95% CI)
Health behaviors			
Current smoking	30.5 (28.8–32.3)	14.5 (14.0–15.0)	1.5 (1.3–1.6)
Exercise in past month	67.1 (65.3–68.9)	79.8 (79.2–80.4)	0.9 (0.9–0.9)
Heavy Drinking	4.4 (3.7–5.3)	4.5 (4.2–4.8)	0.9 (0.7–1.1)
Health Status			
Fair or Poor Health	35.0 (33.2–36.8)	6.7 (6.3–7.1)	3.8 (3.4–4.2)
Diabetes	12.4 (11.3–13.6)	5.6 (5.3–6.0)	11.8 (1.6–2.0)
Frequent Mental Distress	34.7 (32.9–36.5)	9.4 (9.0–9.9)	2.9 (2.7–3.2)
Obesity	37.5 (35.7–39.4)	22.8 (22.2–23.5)	1.4 (1.3–1.5)
Asthma	29.1 (27.4–30.8)	13.5 (13.0–14.0)	1.9 (1.8–2.1)
Adequate Social Support	67.5 (65.7–69.2)	84.2 (83.6–84.8)	0.9 (0.8–0.9)
Preventive Health Care			
HIV test ever	61.0 (59.1–62.9)	52.0 (51.2–52.7)	1.1 (1.1–1.2)
PAP test in past three years	93.0 (91.9–94.0)	89.6 (89.0–90.1)	1.0 (1.0–1.0)
Checkup in the past year	62.9 (61.0–64.7)	65.1 (64.3–65.8)	1.1 (0.9–1.0)
Dental check up in the past year	55.9 (54.0–57.8)	70.1 (69.4–70.9)	0.9 (0.9–0.9)
Influenza shot in past year	31.5 (29.8–33.3)	31.7 (31.0–32.4)	1.1(1.0–1.1)

^a Adjusted Prevalence Ratios, adjusted for age, race/ethnicity, education, marital status, employment, and health insurance