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Pregnant women's interest in a website or mobile application for healthy gestational weight gain

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Abstract

We examined pregnant women's interest in using a website or mobile application to help them gain a healthy amount of weight during pregnancy. Pregnant women (N=64) completed a short questionnaire during routine prenatal care at hospital-based obstetric clinics in [STATE] during April-August 2012. Eighty-six percent reported interest in using a website or mobile application to help them gain a healthy amount of weight; interest ranged from 67–100% across demographics, clinical characteristics, and technology use. The Internet is a promising modality for delivering interventions to prevent excessive gestational weight gain and associated maternal and child health consequences.

Keywords

Pregnancy; weight gain; Internet; information seeking; mhealth

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CONFLICTS OF INTEREST

Dr. Pagoto is on the advisory board of Empower Fitness and has a contract with Sears FitStudio.
The authors have no other conflicts of interest to disclose.

INTRODUCTION

Weight gain during pregnancy exceeding Institute of Medicine recommendations has been associated with short- and long-term health consequences for both mother and child, yet upwards of half of women gain more than recommended(1). The best strategy for preventing excessive gestational weight gain is unknown(2). The Internet may be an ideal delivery mechanism for pregnant women, given prevalent online information-seeking during pregnancy(3), barriers to in-person interventions during pregnancy(4), and women's familiarity with the myriad of existing pregnancy-related mobile applications(5). The aim of this study was to examine pregnant women's interest in using a website or mobile application to help them achieve healthy weight gain during pregnancy.

METHODS

We surveyed pregnant women at an academic medical center in [STATE] from April to August 2012. Research staff approached women during routine prenatal care after receiving permission to do so by nurses. Eligible women were pregnant and able and willing to complete a brief anonymous questionnaire in English. Women did not receive monetary or other incentive for participation. [INSTITUTION'S] Institutional Review Board approved this study.

The questionnaire was designed to take 5 minutes to complete. Women indicated their agreement with the statement "I would be interested in using a website or app to help me make healthy choices for myself and my baby and to keep my weight gain on track." and responses were categorized as interested ("strongly agree" or "agree") versus not interested ("neither agree nor disagree""disagree", or "strongly disagree"). Women were then asked to indicate their agreement with the statement "I would want a mobile version of the website that would make it easier to look at on my cell phone or mobile device."; those who responded "agree" or "strongly agree" were considered to want a mobile version. Women reported whether they accessed the Internet during the past four weeks from the following devices: desktop, laptop, or tablet computers, from a cell phone, and/or from another Internet-enabled device. Women were asked if they had looked online during the current pregnancy for any of seven topics related to pregnancy or their unborn baby; women endorsing one or more topics were categorized as having looked online for pregnancy-related information. Demographic and pregnancy characteristics were self-reported. Pre-pregnancy body mass index (BMI; kg/m^2) was calculated from self-reported height and pre-pregnancy weight and was categorized as underweight (BMI < 18.5 kg/m^2), normal weight (18.5 $kg/m^2 \leq$ BMI < 25.0 kg/m^2), overweight (25.0 $kg/m^2 \leq$ BMI < 30.0 kg/m^2), or obese (30.0 $kg/m^2 \leq$ BMI) (1). Data were summarized using SAS (Version 9.2, SAS Institute, Inc., Cary, NC).

RESULTS AND DISCUSSION

Of 82 women approached during routine prenatal care, 3 reported previously completing the survey, 9 were not interested in participating, and 6 were pressed for time or not feeling

well; 64 women completed the survey, for a response rate of 81%. Characteristics of the sample are presented in Table 1.

The vast majority of women surveyed (94%, n = 60) reported looking online for pregnancy information during the current pregnancy, similar to previous research(3). Pregnant women are open to and already engaged in accessing online health information. Ninety-five percent (n = 61/64) of respondents reported Internet access during the past four weeks, with 89% (n = 57) reporting daily Internet access (Table 1). Smartphones were the most commonly reported device used by pregnant women who reported Internet access; 84% of pregnant women accessed the Internet via a smartphone compared to 66% via laptop, 49% via a desktop computer, 31% via a tablet, and 23% via another device. A recent study found that of the numerous pregnancy-related apps, 40% were informative, yet the 13% of apps that were interactive were the most highly rated(5). Together, this indicates that pregnant women are seeking pregnancy-related information online, and Internet-delivered interventions for pregnancy health should be interactive.

Eight-six percent (n=55) of the sample reported interest in using a website or mobile application to help them gain a healthy amount of weight during pregnancy. Interest among groups defined by demographics, clinical characteristics, and technology use ranged from 67% to 100% (Table 1). Even among women who reported no Internet access over the past four weeks, 2 of 3 women reported interest in using a website or mobile application for pregnancy weight gain. Pregnant women face challenges to in-person behavioral interventions during pregnancy, including conflict with work schedules, lack of transportation, and a need for childcare for older children(4). An intervention delivered via a website or mobile application could overcome these challenges to participation. The findings of the current study suggest that the majority of pregnant women would find this delivery mechanism desirable.

Among those interested in a website or mobile application for gestational weight gain, 89% (n=49) indicated that they would like a mobile version to make it easier to view on their cell phone or mobile device. Our results suggest that Internet-delivered gestational weight gain interventions should be designed to be accessible via smartphones and other mobile devices in addition to via desktop or laptop computers.

This study has strengths and limitations. The survey was offered in English only, thus limiting generalizability. Additionally, our sample was recruited from obstetric clinics in a tertiary care setting and did not include women receiving prenatal care at private obstetric practices, in family medicine or community health settings, or women not receiving prenatal care. Our sample was racially/ethnically and socioeconomically diverse, increasing the likelihood that our findings are generalizable to obstetric populations at other academic sites across the United States. Our modest sample size limited power for statistical comparisons.

Conclusions

The vast majority of this racially/ethnically and socioeconomically diverse sample of pregnant women reported regular Internet access and interest in using a website or mobile

application to help them gain a healthy amount of weight during pregnancy. The Internet may be a promising modality for interventions to prevent excessive gestational weight gain and for other interventions for pregnant women.

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REFERENCES

1. Rasmussen, KM.; Yaktine, AL., editors. Weight Gain During Pregnancy: Reexamining the Guidelines. Washington, D.C.: Institute of Medicine and National Research Council of the National Academies; 2009.
2. Muktabhant B, Lumbiganon P, Ngamjarus C, Dowswell T. Interventions for preventing excessive weight gain during pregnancy. Cochrane Database of Systematic Reviews. 2012; 4:CD007145. [PubMed: 22513947]
3. Huberty J, Dinkel D, Beets MW, Coleman J. Describing the Use of the Internet for Health, Physical Activity, and Nutrition Information in Pregnant Women. Matern Child Health J. 2013 Oct 23; 17(8):1363–1372. [PubMed: 23090284]
4. Coleman-Phox K, Laraia BA, Adler N, Vieten C, Thomas M, Epel E. Recruitment and retention of pregnant women for a behavioral intervention: lessons from the Maternal Adiposity, Metabolism, and Stress (MAMAS) Study. Prev Chron Dis. 2013; 10(120096)
5. Tripp N, Hainey K, Liu A, Poulton A, Peek M, Kim J, et al. An emerging model of maternity care: Smartphone, midwife, doctor? Women Birth. 2014 Mar; 27(1):64–67. [PubMed: 24295598]

Highlights

- We asked pregnant women about a website or mobile app for gestational weight gain
- 89% accessed the Internet daily; 75% from a smartphone or tablet
- 85% expressed interest in a website or app for healthy weight gain during pregnancy
- 67–100% were interested across demographics, clinical factors, and technology use
- Among those interested, 89% wanted a mobile version to access via smartphone

Table 1

Demographic, clinical, and technology use characteristics of pregnant participants, and proportion interested in using a website or mobile application to help them gain a healthy amount of weight during pregnancy by these characteristics, among women receiving routine prenatal care at hospital-based obstetric clinics in [STATE], April-August 2012 (N=64)[a]

	Total sample, n (%)	Interested in Internet-delivered gestational weight gain intervention, n (%)
Age		
18–24 years	19 (30)	17 (89)
25–29 years	27 (42)	24 (89)
30+ years	18 (28)	14 (78)
Race/ethnicity		
Non-Hispanic white	31 (48)	28 (90)
Non-Hispanic black	8 (13)	6 (75)
Hispanic/Latina	18 (28)	14 (78)
Other race/ethnicity	7 (11)	7 (100)
Education		
High school/GED or less	27 (42)	23 (85)
Trade/technical school or some college	19 (30)	16 (84)
Bachelors degree or higher	18 (28)	16 (89)
Marital status		
Married	32 (50)	27 (84)
Living with partner	17 (27)	14 (82)
Single, separated, divorced, or widowed	15 (23)	14 (93)
Hard to pay for basics		
Not at all hard	36 (58)	28 (78)
Somewhat or very hard	26 (42)	25 (96)
Pre-pregnancy weight status		
Underweight	3 (5)	3 (100)
Normal weight	29 (48)	24 (83)
Overweight	14 (23)	12 (86)
Obese	14 (23)	13 (87)
First pregnancy		
No	39 (61)	32 (82)
Yes	25 (39)	23 (92)
Trimester of pregnancy		
First trimester	9 (15)	9 (100)
Second trimester	27 (45)	23 (85)
Third trimester	24 (40)	22 (92)

	Total sample, n (%)	Interested in Internet-delivered gestational weight gain intervention, n (%)
Internet access during past four weeks		
Daily Internet access	57 (89)	50 (88)
Less frequently than daily	4 (6)	3 (75)
No Internet access past four weeks	3 (5)	2 (67)
Daily Internet access from smartphone and/or tablet computer		
Yes	48 (75)	42 (88)
No	16 (25)	13 (81)
Looked online for information about pregnancy or baby during this pregnancy		
Yes	60 (94)	52 (87)
No	4 (6)	3 (75)

[a] May not sum to n=64 due to missing data in characteristics; n's provided.