

Preconception Health: Awareness, Planning, and Communication Among a Sample of US Men and Women

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Abstract It is important to educate both men and women about preconception health (PCH), but limited research exists in this area. This paper examines men's and women's awareness of exposure to PCH information and of specific PCH behaviors, PCH planning, and PCH discussions with their partners. Data from Porter Novelli's 2007 *Healthstyles* survey were used. Women and men of reproductive age were included in the analysis ($n = 2,736$) to understand their awareness, planning, and conversations around PCH. Only 27.9% of women and men reported consistently using an effective birth control method. The majority of men (52%) and women (43%) were unaware of any exposure to PCH messages; few received information from their health care provider. Women were more aware than men of specific pre-pregnancy health behaviors. Women in the sample reported having more PCH conversations with their partners than did men. PCH education should focus on both women and men. Communication about PCH is lacking, both between couples and among

men and women and their health care providers. PCH education might benefit from brand development so that consumers know what to ask for and providers know what to deliver.

Keywords Preconception · Pregnancy · Knowledge · Awareness · Communication

Introduction

Preconception health (PCH) refers to the health of women of reproductive age [1]. Preconception care (PCC) involves the identification and management of potential risks to improve pregnancy outcomes [1]. Translated to health behavior, PCH guidelines encourage women across their reproductive lifespan to create and maintain a reproductive life plan; cease illicit drug and tobacco use and limit alcohol use; exercise and eat a healthy diet; consult with a doctor about prescription medication; take a multivitamin with folic acid; ensure that vaccinations are up to date; monitor any other health problems such as diabetes; avoid exposure to environmental toxins; and track family health history [1]. Many organizations, including the Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists (ACOG) have urged health care professionals to integrate PCC into their routine care and to offer it throughout the reproductive lifespan [1, 2].

The CDC has also called for increased consumer awareness and knowledge of PCH and recommended social marketing as a method that public health professionals can use to engage consumers (women, men, and couples) [1]. Andreasen defines social marketing as “the application of commercial marketing technologies to the analysis,

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planning, execution, and evaluation of programs designed to influence voluntary behavior of target audiences in order to improve their personal welfare and that of society” [3]. Applied social marketing begins with audience research [4], which offers social marketers insight into developing behavior change and communication interventions. While some organizations (March of Dimes, ACOG) and states (California, North Carolina) have made efforts to reach out to consumers, to date there have been no comprehensive national efforts or audience research related to PCH. Assessing consumers’ current levels of exposure to PCH messages, general awareness of PCH, and knowledge about PCH behaviors will help inform social marketing efforts at all levels.

Frey and Files [5] found that women already receiving well-woman care were knowledgeable about risk factors like tobacco, alcohol, and drug use. Among a group of college-age men and women, Delgado [6] similarly found high awareness of substance use cessation and moderate awareness of the dangers of sexually transmitted disease to the fetus and the need for a couple to visit a health care provider before pregnancy. The African-American women surveyed by Canady, Tiedje, and Lauber [7] were unfamiliar with the idea of talking with a health care provider before pregnancy but said they practiced other PCH behaviors before becoming pregnant. If all beneficial PCH behaviors are to be widely adopted, consumer awareness and knowledge first need to increase; they are necessary precursors to behavior change, as information processing and persuasion theories suggest [8, 9].

In addition to a lack of consumer promotion and demand, PCC has also not yet been widely implemented in the health care delivery system [10, 11] for a host of reasons. The U.S. health care system remains reactive, responding to the treatment of existing conditions rather than emphasizing the prevention of those conditions through preventive care [12]. Providers tend to assess specific problems such as maternal illicit drug and alcohol use, maternal smoking, or maternal age as needed [13, 14] rather than deliver a comprehensive care program to every man or woman of reproductive age. It has been suggested that women receive PCC opportunistically, meaning during a routine well-woman visit or even an acute care visit, but there are no data to indicate its implementation [15].

Most of the previous studies focus on PCH and women. As Frey and Files [5] suggest, PCH needs to incorporate both women and men. Conception typically involves sex and a relationship. Therefore, it is important that PCH education target both individuals in a relationship. Furthermore, both women’s and men’s reproductive health can be affected by a range of environmental influences and lifestyle choices [16]. Husbands, boyfriends, and domestic

partners should be mindful of their ability to conceive and have a healthy baby [17].

Partners can also influence and support each other in the adoption of healthy behaviors. Social support theory [18, 19]; social networks literature, through intermedia theory and diffusion of innovations [20, 21]; and social influence literature, through interdependence theory [22], all indicate that interpersonal communication between couples can lead to positive or negative attitudes about health behaviors and behavior change. This has been shown in research in the areas of smoking, alcohol consumption, and exercise [23–26]. Similarly, in a prenatal care study, researchers found that fathers influence mothers’ health both positively and negatively [27]. We were unable to locate research that examines the couple in the context of PCH.

In sum, the literature about PCH awareness and couples’ knowledge is minimal. PCH information tends to focus on the woman rather than on the couple. This paper reports on results from a survey examining and comparing men’s and women’s (1) awareness of exposure to PCH information, (2) knowledge of specific PCH behaviors, (3) PCH planning, and (4) PCH discussions with their partners.

Methods

Data for this study were obtained from Porter Novelli’s *Healthstyles 2007*. *Healthstyles* is a subset of a multi-wave consumer-mail panel study administered by Synovate, Inc. annually to ascertain perspectives on consumer health attitudes, beliefs, and behaviors. *Healthstyles* is a follow-up survey that is mailed to respondents who complete *Consumerstyles*, which collects data on the use of media, consumer products and services, and personal interests. *Consumerstyles* surveys were mailed to a stratified random sample of panel households balanced on region, household income, population density, age, and household size. Low-income and minority households were oversampled to ensure adequate numbers of respondents. A total of 11,758 individuals completed the *Consumerstyles* survey yielding a response rate of 58.8%.

Synovate’s panel contains approximately 340,000 adults aged ≥ 18 years who have been invited to join the panel through selective direct mailings to household lists and referrals from existing panel members. Respondents receive a \$2.00 incentive and a chance to win additional sweepstakes prizes for their participation. Synovate’s panel results have shown very close agreement with national population probability sampling data using Random Digit Dial (RDD) [28, 29].

The *Healthstyles 2007* survey was fielded from July through August. A total of 6,600 surveys were mailed one time to potential respondents with a response rate of 66.6%

($n = 4,398$). *Healthstyles* data are drawn to be nationally representative [28, 29] and were post-stratified and weighted on the basis of sex, age, income, race, and household size to reflect 2006 US Census estimates.

The *Healthstyles* survey investigates a wide range of topics each year (e.g., injury prevention, nutrition, genetic testing). A series of questions was added to the 2007 *Healthstyles* survey to assess both male and female perspectives in the context of awareness of general PCH information, knowledge of PCH behaviors, PCH planning, and perceptions of PCH discussions occurring between men and women in the sample and their partners. *Healthstyles* items are developed by Porter Novelli, a social marketing and public relations firm, with standard formats used in their annual surveys since 1995. The items of interest included in this analysis are shown in Table 1.

Women were included in the analysis if they were between ages 18 and 44 and could have children (i.e., had not indicated that they were post-menopausal or had had a tubal ligation or hysterectomy). Men were included in the analysis if they were between ages 18 and 64. No parallel question regarding physical ability to have children was asked of men on this survey.

Both frequencies and chi-square tests of independence were conducted using SPSS version 15.0. Frequencies were computed to summarize respondent awareness of general PCH information and knowledge of PCH behaviors. For knowledge of PCH information, data were presented in terms of high, fair, and low levels of knowledge reported by men and women. Statistically significant sex differences ($P < 0.05$) are noted. Chi-square tests of independence were performed to examine the relationship between sex and discussions about PCH discussions among sexually active men and women in the sample and their partners. Moreover, a measure of agreement relative to disagreement was calculated by sex for each PCH discussion topic. More specifically, the percentage of respondents who strongly disagreed and disagreed was subtracted from the percentage of respondents who strongly agreed and agreed. The residual agreement or disagreement results are presented.

Results

The study population consisted of 2,736 individuals of which 1,796 were men and 940 were women. The greatest percentage of men were white (67.8%), were 45–54 years of age (25.3%), were married (64.2%), had some college education (36.3%), and had an annual household income $\geq 60,000$ (45.3%). The largest percentage of women in the sample were white (62.9%), were 25–34 years of age (35.1%), were married (52.4%), had some college education (40.1%), and had an annual household income

of $\geq 60,000$ (32.8%). Table 2 provides additional sample characteristics.

Awareness of PCH Information

The level of awareness of PCH messages among men and women was limited. When asked if they had seen, heard, or read anything about recommendations for PCH anywhere recently, 52% of men and 43% of women said they had not (Table 3). Television (25.5–30.6%) and magazines (19.9–29.5%) were the most prominently reported sources for receiving PCH information. Only 11.1% of men and 22.2% of women reported receiving PCH information from their health care provider. In addition, men and women differed by more than 9% points with regard to the source of information for magazines and health care providers.

Knowledge of PCH Behaviors

Participants were asked which of the 11 PCH behaviors listed were important for women to do before becoming pregnant. Men in the sample were generally aware of which behaviors were important for women to do before they get pregnant. Men selected avoiding cigarette use (83.6%), avoiding illegal drugs (81.2%), avoiding alcohol (80.5%), eating a healthy diet (76.7%), and talking to their doctor (68.0%) with a frequency of greater than 65.0% for each option (Table 4). A fair amount of knowledge existed with regard to being aware of family medical history (61.2%), folic acid intake (52.1%), use of prescription medicines (41.6%), and vaccines (40.1%). Only 18.5% of men knew that getting a flu shot was an important pre-pregnancy behavior.

Women in the sample were more aware of the 11 PCH behaviors than their male counterparts. Women knew that avoiding cigarette use (90.8%), avoiding illegal drugs (89.3%), avoiding alcohol (86.9%), eating a healthy diet (77.8%), talking to their doctor (77.3%), taking a multivitamin with folic acid (72.0%), and awareness of medical history (71.2%) were important and selected those options with a frequency of greater than 65.0%. Women had only a fair amount of knowledge about being up-to-date with vaccines (48.8%), and they were least aware of the importance of getting a flu shot (22.3%).

Overall, both men and women perceived avoiding cigarettes, illegal drugs, and alcohol use to be the most important PCH behaviors for women. The greatest disparity in perceived importance of women's PCH behaviors was found in the context of taking a multivitamin with folic acid, with only 52.1% of men perceiving it to be important compared with 72.0% of women. Differences in perceived importance of women's PCH behaviors between men and women were also found with regard to talking to a doctor

Table 1 Preconception health questions in 2007 *Healthstyles* survey

1. If you have seen, heard, or read anything about recommendations for preconception health anywhere recently, where was it? ("X" all that apply)		
TV program	Internet or web	Employer
Radio	E-mail message	Health care provider
Newspapers	Newsletter	Some other places
Magazines	Insurance provider	Nothing recently
2. Which of the following actions have you heard are the most important things for women to do before they get pregnant? ("X" all that apply)		
Talk to their doctor about pregnancy		Take prescription medicine as directed by a doctor
Avoid using illegal drugs		Take a multivitamin with folic acid
Eat a healthy diet		Be aware of their family medical history
Exercise most days of the week		Be up-to-date with all their vaccines
Avoid drinking alcohol		Get a flu shot
Avoid smoking cigarettes		Nothing
3. How long do you want to wait until you begin or add to your family? ("X" one)		
I do not want any children		2–5 years
I have had all my children		6–10 years
Within a year		More than 10 years
4. What are you doing to prevent a pregnancy? ("X" one)		
Not having sexual intercourse		Using other contraception methods and hoping that they work
Consistently using an effective birth control method		Other
Ensuring that my partner uses an effective birth control method		Nothing
Relying on emergency contraception, if needed		Not applicable: Am trying to get pregnant
<i>Asked of men and women who identified as being sexually active</i>		
5. Please tell me how much you agree or disagree with each of the following. (Circle one number for each statement [1 = strongly disagree and 5 = strongly agree])		
My partner and I had/have a plan for having a child		
My partner and I talked about when we wanted/want to have a child		
My partner and I talked about how to prevent a pregnancy		
My partner and I would be happy if we accidentally became pregnant		
My partner and I talked about how many children we wanted/want to have		
My partner and I talked with a health care provider about having a child		

about pregnancy (68.0% of men vs. 77.3% of women), awareness of family medical history (61.2 vs. 71.2%), being up-to-date with vaccines (40.1 vs. 48.8%), and avoiding illegal drug use (81.2 vs. 89.3%).

PCH Planning

The desire for children was skewed toward younger segments of the sample population (Table 5). Among all respondents, 34.3% of the sample intended to have a child within the next 1–5 years. This intention was highest among 18- to 24-year-old women (75.0%) and men (62.9%) followed by 25- to 34-year-old women (58.0%) and men (51.5%). With regard to pregnancy prevention, 27.9% of the

sample reported consistently using an effective birth control method, while 23.5% reported doing nothing at all.

Perceptions of PCH Discussions

Of particular interest in this study was the exploration of the degree to which there was congruence among men and women with regard to their perceptions of PCH discussions with their partners. With the exception of number of children desired (χ^2 [4, $n = 1,928$] = 8.73, $P = 0.068$), sex was significantly related to agreement on having a family planning plan in place (χ^2 [4, $n = 1,940$] = 40.25, $P < 0.001$), the extent to which respondents talked about when they wanted to have a child (χ^2 [4,

Table 2 Study population demographics (*N* = 2,736)

	Men (%)	Women (%)
Age		
18–24	12.0	34.1
25–34	20.7	35.1
35–44	22.4	30.9
45–54	25.3	–
55–64	19.6	–
Ethnicity		
White	67.8	62.9
African American	10.5	14.4
Hispanic	14.2	14.7
Other	7.6	8.0
Education (highest level)		
<High school	6.6	3.3
High school graduate	24.7	25.6
1–3 years college	36.3	40.1
College graduate	19.9	22.1
Post graduate	12.5	8.7
Household income		
<\$15K	10.3	17.6
\$15K–\$24.9K	8.1	17
\$25K–\$39.9K	17.1	14.7
\$40K–\$59.9K	19.2	17.9
≥\$60K	45.3	32.8
Marital status		
Married	64.2	52.4
Widowed	0.4	1.1
Divorced	6.4	3.4
Seperated	0.8	1.3
Never married	21.8	36.8
Domestic partnership	6.5	5.0

n = 1,930] = 30.76, *P* < 0.001), how to prevent a pregnancy (χ^2 [4, *n* = 1,927] = 14.76, *P* < 0.01), happiness regarding accidentally becoming pregnant (χ^2 [4, *n* = 1,926] = 69.93, *P* < 0.001), and perceived family planning interaction with a health care provider (χ^2 [4, *n* = 1,922] = 18.55, *P* < 0.01). Due to space limitations, data were not presented in a separate table.

Preconception health discussion topics were also analyzed by sex (Fig. 1). Overall, men in the sample were more likely to agree than disagree that they had talked with their partners about how many children they wanted (34.2%), how to prevent a pregnancy (29.4%), and when to have a child (13.0%). In contrast, they were more likely to disagree than agree that they talked with a health care provider about having a child, they would be happy if they accidentally became pregnant, and they discussed child planning with their partners. By comparison, women in the sample had more discussions with their partners about PCH

Table 3 Awareness of preconception health messages

	Men (%)	Women (%)
If you have seen, heard, or read anything about recommendations for preconception health anywhere recently, where was it?		
TV program	30.6*	25.5
Radio	11.9*	9.1
Newspapers	14.2*	9.7
Magazines	19.9*	29.5
Internet or web	7.6*	15.3
E-mail message	2.0	3.1
Newsletter	3.5	2.6
Insurance provider	5.5	5.8
Employer	3.5	2.4
Health care provider	11.1*	22.2
Some other places	5.1*	10.3
Nothing recently	52.0*	43.0

Respondents were asked to select all that apply

* *P* = 0.05

Table 4 Male and female perceptions of important women’s preconception health behaviors

	Men (%)	Women (%)
Most important things for women to do before they get pregnant?		
Talk to their doctor about pregnancy	68.0*	77.3
Avoid using illegal drugs	81.2*	89.3
Eat a healthy diet	76.7	77.8
Exercise most days of the week	39.8*	45.5
Avoid drinking alcohol	80.5*	86.9
Avoid smoking cigarettes	83.6*	90.8
Take prescription medicines as directed by a doctor	41.6	42.6
Take a multivitamin with folic acid	52.1*	72.0
Be aware of their family medical history	61.2*	71.2
Be up-to-date with all their vaccines	40.1*	48.8
Get a flu shot	18.5*	22.3
Nothing	5.7*	1.0

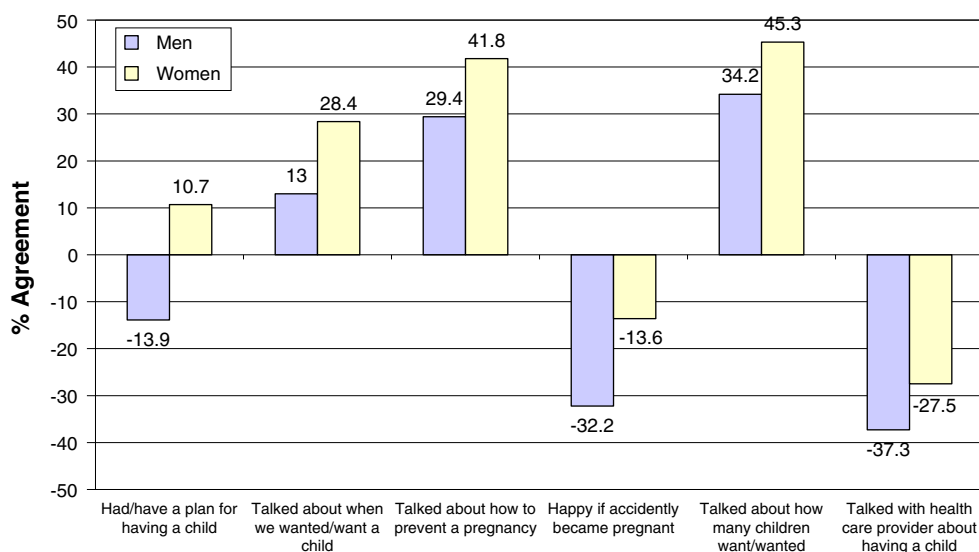
Respondents were asked to select all that apply

* *P* = 0.05

issues. Women were more likely to agree than disagree that they planned having a child with their partners (10.7%) and that they talked with their partners about the timing of a pregnancy (28.4%), the number of children desired (45.3%), and how to prevent a pregnancy (41.8%). Similar to men in the sample, overall, women were more likely to disagree than agree that they would be happy if they accidentally became pregnant and that they had talked with a health care provider about having a child.

Table 5 Preconception health planning by age group

	Men (%)					Women (%)			All
	18–24	25–34	35–44	45–54	55–64	18–24	25–34	35–44	
How long do you want to wait until you begin or add to your family?									
I do not want any children	9.4	15.5	31.7	31.9	32.3	8.4	12.5	30.6	22.6
I have had all my children	12.9	27.5	48.1	62.2	65.0	3.1	27.4	47.9	38.9
Within a year	14.9	22.1	8.2	2.4	0.9	17.4	24.0	13.4	12.4
2–5 years	48.0	29.4	11.1	3.3	0.6	57.6	34.0	6.7	21.9
6–10 years	12.9	3.8	0.3	0.0	0.0	12.5	2.2	0.7	3.4
More than 10 years	2.0	1.6	0.5	0.2	1.2	0.9	0.0	0.7	0.9
What are you doing to prevent a pregnancy?									
Not having sexual intercourse	18.0	6.9	8.8	8.6	6.7	11.7	8.1	14.9	9.9
Consistently using an effective birth control method	18.5	27.1	23.7	18.0	9.3	51.3	38.8	35.4	27.9
Ensuring that my partner uses an effective birth control method	12.2	17.0	10.5	3.3	4.8	4.5	7.8	9.3	8.5
Relying on emergency contraception, if needed	3.2	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.4
Using other contraception methods and hoping that they work	11.6	1.7	2.8	1.5	1.1	1.3	4.6	3.0	3.0
Other	3.2	16.7	24.0	25.6	26.0	4.2	10.7	14.6	16.7
Nothing	29.1	19.3	19.3	33.8	36.8	14.0	18.9	15.3	23.5
Not applicable: Am trying to get pregnant	4.2	11.2	11.2	8.4	15.2	13.0	11.1	7.5	10.1

**Fig. 1** Agreement on preconception health discussions within topic by sex

Discussion

This paper uses 2007 *Healthstyles* survey results to examine PCH knowledge and awareness, PCH planning, and PCH discussions among a sample of US men and women. Results of this survey contribute to the limited amount of research examining consumers' PCH knowledge, awareness, and behaviors. This research also explores male and female perspectives about PCH, another topic area with limited information available. PCH

education needs to include both men and women so that (1) both partners can understand how their health behaviors might affect a future pregnancy, and (2) partners can positively support or influence one another while pursuing healthy PCH behaviors [17].

The data indicate strong awareness, among both men and women, of avoiding illegal drugs, smoking and alcohol use as the most important things for a woman to do before getting pregnant. This finding parallels other literature on the subject [5, 6]. Most women and men were aware that

talking to their doctor was important before pregnancy, a finding also supported by previous literature [5, 6], and they were aware of the importance of eating a healthy diet. The greatest disparity existed between men and women on the issue of folic acid. It should be noted that additional research into folic acid awareness is needed, as the results here differ from a recent poll with much lower awareness scores [30]. Other areas of low awareness included being up to date with vaccines and the importance of getting a flu shot. Health care providers and PCH educators should look to these low awareness scores as areas of opportunity to elevate certain PCH behaviors.

The results of this study suggest that future efforts should encourage the development of PCH education and outreach. One specific approach might be to use a key social marketing tool known as branding to develop an identity for PCH [31]. A PCH brand would serve as a package containing multiple behavior messages, tailored and tested with the appropriate segments so that it resonates with both women and men. A brand would help consumers know what to ask for when interacting with their health care providers and would help orient health care providers to the nature of the visit. Much more consideration needs to be given to the packaging of multiple health behavior messages, or message bundling, in the context of PCH education. Results from this survey also provide some direction for communication channels for brand promotion. Survey results point to television and magazines as possible venues for PCH educators' consideration.

Pregnancy planning is a particularly important part of couples' PCH education. One of the best ways to decrease adverse pregnancy outcomes is to increase the number of planned pregnancies [32, 33], but planning does not happen as often as it should. Almost half of pregnancies in the United States are unplanned [33]. Couples actively planning a pregnancy will be more likely to adopt other positive PCH behaviors. Planning mitigates the stressors—such as financial or interpersonal [34, 35]—that can accompany unplanned pregnancies. Unfortunately, pregnancy planning can be a challenging subject matter to address with consumers. Previous research has found that young women, in particular, do not perceive pregnancy or the need to plan for pregnancy as relevant [36]. Similar research should be carried out with couples.

Survey results showed that communication about PCH is lacking, both between couples and among men and women and their health care providers. With little additional research available regarding partners' conversations about health and well-being, this is an important area for future efforts. Communication between couples about PCH issues can lead to greater awareness and practice of PCH behaviors.

The finding that men and women reported receiving recent PCH recommendations from a health care provider

in limited numbers is reflective of the country's tendency towards reactive, rather than preventive, health care. The finding, which is consistent with other literature [16], is interesting given the fact that a majority of men and women were aware that a woman should talk with her doctor before pregnancy. Other results from *Healthstyles* are worth considering alongside the results shown here for additional background. Within the sample, the majority of men (65%) and women (57%) reported having two or fewer visits to a primary care physician in the last year. Thus, while consumers visit their providers and might be aware of the need for women to receive PCH guidance from their providers, the actual conversations are occurring with limited frequency. In all, the results suggest that we are not yet reaching men and women across the reproductive lifespan, in accordance with PCH recommendations [37]. Social norms surrounding the type of health care delivered by providers and demanded by consumers will likely need to change in order to increase these types of discussions.

The present study has several limitations. First, *Healthstyles* is a national mail survey that relies on self-report data. Furthermore, responses from the men and women surveyed were not paired; rather, they were perceptions of conversations between respondents and their partners. The data also included more men than women because of their longer reproductive lifespan and because the survey did not include a question that would allow for the exclusion of men who were unable to have children. Bivariate analyses conducted did not adjust for potential confounders.

Some additional information would have been helpful in interpreting the data. For example, a PCH knowledge assessment question would have revealed whether respondents knew what the term "preconception health" meant. Research has suggested that the term is not yet well understood [35]. This problem highlights the need to find the right terminology to be used consistently and to develop those terms into a brand of care.

Future Research and Implications for Communication

This study points to a need for more research to understand PCH awareness, knowledge, and knowledge gaps among consumers, especially couples. Such research will help support communication and health education activities.

The role of the couple in PCH also warrants further investigation. Interpersonal communication between partners can lead to positive or negative attitudes about health behaviors and even behavior change, but additional efforts should evaluate these premises in the context of PCH. Furthermore, women with adequate access to health care are more likely to receive PCH education and PCC because

messages are delivered through obstetricians-gynecologists and other health professionals. The same cannot be said of men, who are less likely to seek primary care and often do not have regularly scheduled wellness visits in place [17].

Marketing and delivery of a PCH brand is also an area for future research [4]. PCH is indisputably complex, with consumer needs, policy, and clinical and healthcare delivery realities sometimes at odds with one another. Additional effort is needed to understand which models of PCH and PCC are working and why so that success stories can be emulated and broader diffusion is possible.

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