Polycystic Ovary Syndrome, Absent from National Surveillance and Present Online: Implications for Mental and Behavioral Health

by

Ninive Sanchez

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Social Work and Psychology)
in The University of Michigan
2015

Doctoral Committee:

Professor Jorge Delva, Co-Chair
Professor Lorraine M. Gutiérrez, Co-Chair
Professor Toni Antonucci
Professor Lilia Cortina
Professor Michael Spencer

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Acknowledgements

I would like to thank the University of Michigan School of Social Work, Department of Psychology, Rackham Graduate School, and my committee members for helping me succeed in my doctoral studies.

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Abstract

In the United States there is a need to increase awareness and management of polycystic ovary syndrome (PCOS), a metabolic, reproductive, and endocrine condition the National Institutes of Health has described as a major public health problem for women. PCOS is a highly prevalent chronic condition that can begin in adolescence and is associated with irregular or no menstrual periods, excessive body hair, acne, infertility, obesity, anxiety and depression, and poor health-related quality of life. This paper consists of two studies that aim to understand PCOS and women's health in two contexts, the health care system and digital (online) spaces. The first paper examines the demographics and behavioral health care of patients seen for PCOS-related medical visits using national health care data. The findings point to potential disparities in PCOS-related health care access and utilization by age, race, insurance type, and percent poverty greater than 10% in the patient's zip code. Limited information on behavioral health education and mental health including depression screening, depression diagnosis, and mental health care underscores the need to strengthen national surveillance to further understand behavioral health care services for PCOS. The second paper explores how teen and women's digital magazines portray adolescents and women with PCOS to understand discourse and ideologies related to health, illness, and gender in these media. The results suggest these magazine articles contain dominant ideologies of beauty and gender and place considerable personal responsibility on women to improve their health through lifestyle changes. Women were also depicted as change agents that used their personal experiences with PCOS to advocate

for women's health. The results can inform the strategic use of digital women's magazines to promote health and the development of health education programs that train women to be critical consumers of health media. Given that individuals look to the internet and magazines, in addition to health care providers, for health information, these studies highlight how the digital landscape and health care intersect and provide directions for future research to improve women's health.

Chapter 1

Introduction

In the United States, women of reproductive age face significant challenges to health and well-being. These challenges include chronic disease, poor nutrition, discrimination (Ebrahim, Anderson, Correa-de-Araujo, Posner, & Atrash, 2009), disparities in reproductive endocrinology and fertility (Huddleston, Cedars, Sohn, Giudice, & Fujimoto, 2010), inadequate social and emotional support, and frequent mental distress (Willet, Hayes, Zaha, & Fuddy, 2012). Women of color, uninsured, and living in poverty in neighborhoods with poor social capital experience the greatest challenges (Ebrahim et al., 2009).

Social conditions such as poverty and inadequate health and social services can contribute to poor physical and mental health (Bywaters, 2007). As a result, poor health has been referred to as a marker of social disadvantage (Bywaters, 2007) because people's bodies embody the social conditions people live in (Krieger & Davey Smith, 2004; Lewis, Kravitz, Janssen, & Powell, 2011). Efforts to achieve health equity, which refers to the opportunity for all people to attain their full health potential regardless of their social position and other socially determined circumstance (Braveman & Gruskin, 2003; Braveman et al., 2011), calls for particular attention to low socioeconomic status groups, racial and ethnic minorities, women, children, and people with chronic conditions. In the U.S., these are considered priority populations requiring special attention to reduce health and health care disparities among these populations (United States Department of Health and Human Services [HHS], 2013).

Greater efforts are needed to understand the health and social needs of adolescents and women with PCOS, a complex condition the National Institutes of Health (NIH) Office of Disease Prevention has identified as a major public health problem for women in the U.S. (National Institutes of Health [NIH], 2012). PCOS is a chronic condition, a condition that progresses steadily, is long in duration, and requires ongoing medical care (Institute of Medicine [IOM], 2012).

PCOS is characterized by a range or constellation of symptoms including irregular or no menstrual periods, excess hair growth on the face and body (hirsutism), weight gain, acne, ovarian cysts, and thinning hair scalp (NIH, 2012). PCOS can also increase women's risk of type 2 diabetes (Gambineri et al., 2012), cardiovascular disease (Wild et al., 2010), infertility (The Amsterdam ESHRE ASRM Sponsored 3rd PCOS Consensus Workshop Group, 2011), anxiety and depression (Annagür et al., 2013; A. Dokras, 2012; A. Dokras, Clifton, Futterweit, & Wild, 2011; Livadas et al., 2011), and poor health-related quality of life (Li et al., 2011).

The prevalence of PCOS among adult women (18 to 45 years of age) in the U.S. is about 7% (Azziz et al., 2004). However, research with a community sample of women (27 to 34 years of age) in the United Kingdom suggests that the prevalence of PCOS may be even higher than this, from 7.8% to 20.6%, depending on which of three diagnostic criteria for PCOS is used (March et al., 2010). Additionally, using two of these criteria, NIH and Rotterdam, about 70% of women with symptoms of PCOS are estimated to be undiagnosed (March et al., 2010).

PCOS affects development across the life course from utero to the post-reproductive years (40 years and over) (Goverde, Westerveld, Verhulst, & Fauser, 2008). PCOS can first be diagnosed in adolescence (Connor, 2012). Symptoms of PCOS such as irregular periods are not uncommon in adolescence, particularly within two years after the start of menstruation, but

continued irregular periods can be a sign of PCOS (Biro & Emans, 2008; Bremer, 2010). Because PCOS is heterogeneous, which means that the presence of symptoms and symptom severity can vary (The Amsterdam ESHRE ASRM Sponsored 3rd PCOS Consensus Workshop Group, 2011), adolescents' and women's experiences living with PCOS can vary across the life course (Sanchez, 2014).

Providing health care to women with PCOS is costly for the U.S. health care system. The annual economic cost of treating women with PCOS is estimated to be over $4 billion. This includes the costs of evaluating PCOS and treatments for menstrual dysfunction, infertility, diabetes and hirsutism (Azziz, Marin, Hoq, Badamgarav, & Song, 2005). The annual costs may be higher considering that patients with PCOS might also require care from nutritionists, physical therapists, and mental health professionals.

In the U.S., there is a need to improve public and health care provider awareness and management for women with PCOS (NIH, 2012). One of the reasons for this lack of awareness is the condition's misleading name (Corley, 2007) which suggests the problem is the ovaries (NIH, 2012); however, the presence of polycystic ovaries alone does not indicate that a woman has PCOS (NIH, 2012). Additionally, although PCOS is a highly prevalent condition, it does not have the "celebrity" status of other well-known conditions (Corley, 2007, p. 25). Lack of awareness and confusion about PCOS can overlook the needs of people with PCOS from the country's efforts to improve the health and well-being of the population. National goals and objectives to improve the population's health include the Health and Human Services Action Plan to Reduce Racial and Ethnic Health Disparities by enhancing data to adequately collect, report, and track health disparities (HHS, 2011); and the Healthy People 2010 objectives to improve health literacy in the digital age [HHS, 2014].

To advance research in PCOS and women's health, I conducted two studies that bring to light the absence of demographic and behavioral health care data associated with PCOS and the presence of PCOS content in digital health communication. Chapter 2 describes the first study that examines the demographics and behavioral health care of patients seen for PCOS-related medical visits. Chapter 3 describes the second study which explores how teen and women's digital magazines portray adolescents and women with PCOS to understand discourse and ideologies related to health, illness, and gender in these media. Chapter 4 is a conclusion that discusses the intersection of the digital landscape and health care and provides recommendations for future research to improve the health and mental health of women with PCOS.

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Chapter 2

Health Care Access and Utilization associated with Polycystic Ovary Syndrome: Moving Beyond Nationally Suppressed Data

Abstract

Background: Women with PCOS tend to turn to health care providers as a first source of information on PCOS. There is a need to further improve behavioral health services for patients with PCOS. However, limited information is available about the sociodemographic, sociogeographic, mental health, and health education of patients seen for PCOS-related medical visits.

Purpose: To describe patient sociodemographic, sociogeographic, mental health, and health education of patients seen for PCOS-related visits. To test for associations between patient, visit, and geographic characteristics and visit type (PCOS and non-PCOS-related visits).

Methods: Data were from the 2005-2010 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, collected by the National Center for Health Statistics, Centers for Disease Control and Prevention. PCOS-related medical visits were identified using the International Classification of Diseases, 9th Revision, Clinical Modification code 256.4. The data were weighted to produce national estimates of PCOS-related ambulatory medical care services in the United States.

Results: Between 2005 and 2010 there were 246 unweighted records with a diagnostic code of PCOS, representing 3,526,716 medical visits. The mean yearly rate of PCOS-related visits was 587,786 visits, a mean yearly rate of 306 per 100,000 women ages 11 to 60 years old. Patients seen for PCOS-related visits were on average 28 years (SD = 7.0) of age. PCOS-related visits were largely by patients who were younger, White, with private insurance, and living in zip codes with percent poverty level greater than 10%. Items on mental health (depression screening ordered or provided, depression diagnosis at the time of the visit, psychotherapy ordered or provided, mental health care provider seen, and other mental health counseling ordered or provided) and health education ordered or provided (e.g., family planning/contraception, growth/development, stress management, and tobacco use/exposure) did not meet National Center for Health Statistics reliability criteria of at least 30 unweighted records and a relative standard error of less than 30% necessary to produce reliable national estimates.

Conclusions: The findings point to potential disparities in PCOS-related health care access and utilization by age, race, insurance type, and percent poverty greater than 10% in patient's zip code. The inability to meet reliability criteria for mental health and health education data

underscores the need to strengthen national surveillance to further understand behavioral health care services among patients with PCOS.

Keywords: polycystic ovary syndrome, sociodemographic, sociogeographic, mental health services, health education, insurance

While the United States has made considerable advances in women's health, such as reductions in mortality from chronic diseases like breast cancer and cardiovascular disease, less progress has been made in the detection and treatment of PCOS (IOM, 2010). Given the high prevalence of PCOS, the short and long-term effects it has on health and mental health, and its costs to the health care system, it is astounding that data on PCOS are not collected in major national surveys that assess the health of the general population in the U.S. such as those collected by the Centers for Disease Control and Prevention (CDC). As a result, large-scale epidemiological research on PCOS is scarce, and the answer to the basic question "Who has PCOS?" is still unclear. This raises questions about whose bodies and whose concerns are represented and prioritized in our society, questions women's health advocates argue should be asked to understand women's health and gender (Zoller, 2010).

The NIH Office of Disease Prevention recommends researchers "Conduct sufficiently large, well-controlled epidemiologic studies determining the prevalence, phenotypes, and morbidities of PCOS in multiethnic longitudinal studies" (NIH, 2012, p. 8). Such recommendations signal that PCOS is becoming a national priority, and this creates opportunities to bring the largely hidden health issues of populations with PCOS to the forefront of research, practice, and health policy. While large-scale, population-based studies are currently unavailable (NIH, 2012), visit-based national health care data can contribute to our understanding of health care access and utilization associated with PCOS. Research on PCOS-related ambulatory care, also referred to as outpatient care, is important because ambulatory care is the primary method of providing health care services in the U.S. (Guinane & Davis, 2011). Additionally, women with PCOS describe the process of searching for answers to their symptoms as emotional, confusing,

frustrating, and devastating (Snyder, 2006), and tend to turn to physicians as a first source of information on PCOS (Sills et al., 2001).

While researchers have questioned whether young adult women with PCOS are "slipping through the health care cracks" (Dokras & Feldman Witchel, 2014, p. 1), only one study to date has examined health care associated with PCOS using nationally representative health care data (Jason, 2011). In that study, Jason (2011) used 2003-2008 data from the National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS), collected by the National Center for Health Statistics, Centers for Disease Control and Prevention, and found the mean yearly number of PCOS-related medical visits to be 493 per 100,000 women ages 10 to 60 years. Jason (2011) found that patients seen for PCOS-related visits tended to be younger, obese, weigh more, and more likely to be ordered or provided with diet and nutrition counseling, compared to patients seen for non-PCOS-related visits. While previous research has identified important patient and visit characteristics associated with PCOS-related visits, further research is needed to understand potential disparities in PCOS-related health care.

Health care disparities refer to differences in health coverage, access to care, and quality of care between populations (The Henry J. Kaiser Family Foundation, 2012). In the U.S., low-income populations, racial and ethnic minorities, women, and those with chronic disease are considered priority populations. The Agency for Healthcare Research and Quality defines priority populations as groups with health care needs requiring special attention to reduce disparities in health care among these populations (Agency for Healthcare Research and Quality, 2014). For instance, research with NAMCS and NHAMCS has found delayed transitions in care among young adults with chronic disease and with public or no health insurance (Fortuna,

Halterman, Pulcino, & Robbins, 2012), racial and ethnic differences in the treatment of depression and anxiety among patients in primary care (Lagomasino, Stockdale, & Miranda, 2011), and a greater proportion of visits to community health centers by patients living in zip codes with more than 10% of the population living below poverty (Shi, Lebrun, Tsai, & Zhu, 2010).

Research is also needed to better understand how to incorporate mental health treatment in the management of chronic conditions such as PCOS. In the U.S., about one in four adults meets diagnostic criteria for a mental disorder (Kessler, Chiu, Demler, & Walters, 2005). The comorbidity (co-occurrence) of chronic mental and physical illness poses significant burdens to the U.S. population (Gadermann, Alonso, Vilagut, Zaslavsky, & Kessler, 2012), and health care system (Gask, Lester, Kendrick, & Peveler, 2009). This is because comorbidity tends to complicate treatment, affect prognosis, and limit quality of life (IOM, 2012). For instance, depression, one of the most common mental illnesses seen in primary care (Newton, 2013), is associated with poor adherence to treatment, increased symptoms, medical costs, and impairment of daily life (e.g., walking, ability to work), among patients with chronic illness (Katon, 2011). About one-fifth (22.4%) of adults in mental health care drop out of treatment, and patients with psychiatric comorbidity are likely to drop out by the third visit (Olfson et al., 2009). Furthermore, compared to specialist care, mental health problems are less likely to be recognized and managed in primary care due to primary care workers' lack of time, skills, or knowledge of mental health problems (Gask et al., 2009). In the U.S., there is an increasing trend in the prevalence of multiple chronic health conditions such as diabetes, hypertension, and heart disease (Ward & Schiller, 2013); conditions associated with PCOS (Gambineri et al., 2012; Joham, Boyle, Zoungas, & Teede, 2014; Wild et al., 2010), and the prevalence of multiple

chronic health conditions tends to increase with age and is higher among women (Ward & Schiller, 2013). Furthermore, the quality of care for preventive care and chronic disease management (e.g., diabetes) has improved much less, compared to the quality of care for acute treatment (HHS, 2013).

This study aims to further understand health care access and utilization associated with PCOS. The study describes patient sociodemographic and sociogeographic characteristics associated with PCOS-related visits. Patient sociodemographic characteristics include patient age, race, and insurance type. Patient sociogeographic characteristics include percent of the population living in poverty, median household income, and percent of the population with a bachelor's degree or higher in the patient's zip code. This study also examines mental health services and health education ordered or provided at PCOS-related visits. Mental health care items include whether the patient had a diagnosis of depression at the time of the visit, a depression screening exam was ordered or provided, a mental health provider was seen, psychotherapy ordered or provided, and other mental health counseling ordered or provided. Items on health education ordered or provided are in the areas of family planning/contraception, growth/development, stress management, and tobacco use/exposure. The findings can identify potential disparities in PCOS-related health care access and utilization and inform the integration of mental health treatment in the management of chronic disease to improve women's health.

Method

National Health Care Surveys

This study uses annual, cross-sectional data from the 2005-2010 National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS). NAMCS and NHAMCS are part of the National Health Care Surveys conducted

by the National Center for Health Statistics, Centers for Disease Control and Prevention (Centers for Disease Control and Prevention [CDC], 2009b). NAMCS and NHAMCS measure several aspects of health care provision and utilization including patient sociodemographic characteristics, diagnoses, providers seen, and services ordered or provided. Medical visit information is reported by physicians and medical staff or extracted from medical records by trained U.S. Census field representatives. Medical visit information is collected from a variety of health care providers in hospitals and clinics located in the 50 states and the District of Columbia (CDC, 2010a; CDC, 2010b).

Together, NAMCS and NHAMCS provide a nationally representative sample of ambulatory medical visits in the United States (CDC, 2009b). Ambulatory or outpatient care refers to care in which an individual seeking health services is not currently admitted (hospitalized) to any health care institution on the premises. A medical visit refers to a direct, personal exchange between patient and physician or members of his/her staff. This means that visits in which no medical care was provided (e.g., when patients call to receive advice from a physician, only pick up medications or insurance forms, or pay a bill) are outside the scope of the surveys (CDC, 2010a; CDC, 2010b).

NAMCS

NAMCS collects data on ambulatory care provided by non-federally employed, office-based physicians primarily engaged in direct patient care. Examples of these office settings include private, solo, or group practices, community health centers, mental health centers, and family planning clinics. NAMCS utilizes a three-stage design that involves probability samples of primary sampling units (PSUs) (e.g., a county, a group of counties), physician practices within

PSUs, and medical visits within physician practices. There were a total of 180,086 patient record forms in the 2005-2010 NAMCS.

NHAMCS

NHAMCS collects data on ambulatory care in emergency and outpatient departments (EDs and OPDs) of non-institutional, general short-stay (less than 30 days) hospitals, excluding Federal, military, and Veterans Administration hospitals. Outpatient department refers to a hospital facility where non-urgent ambulatory medical care is provided under the supervision of a physician (CDC, 2010b). Emergency department refers to a hospital facility that provides unscheduled outpatient services to patients whose conditions require immediate care and is staffed 24 hours a day. Emergency departments open less than 24 hours a day are included as part of the hospital's outpatient department. An emergency service area is an area within the emergency department where emergency services are provided (CDC, 2010b).

NHAMCS utilizes a four-stage design that involves probability samples of primary sampling units (PSUs), hospitals within PSUs, clinics/emergency service areas within outpatient/emergency departments, and patient visits within clinics/emergency service areas (CDC, 2010b). From 2005-2010, there were a total of 208,956 NHAMCS patient record forms from emergency departments and 201,730 patient record forms from outpatient departments.

NAMCS and NHAMCS also contain income and education data associated with patients' residential zip code based on 2000 Census data. In the public use files, these data are categorized in quartiles (e.g., median household income) or grouped percentages (e.g., percent of population below the poverty level) (CDC, 2012b).

Personally identifying information, such as patient names, street addresses, or social security numbers are not collected in NAMCS and NHAMCS to ensure confidentiality (CDC,

2010a; CDC, 2010b). This study used publicly available, deidentified data and was deemed Exempt from review by the University of Michigan Institutional Review Board.

Measures

This study used data starting from 2005 because that is the year mental health items such as depression at the time of the visit and depression screening ordered or provided were first introduced in NAMCS and NHAMCS OPD. The item on mental health provider seen was first introduced in the 2007 NAMCS and NHAMCS OPD and in the 2009 NHAMCS ED (CDC, 2007a; CDC, 2007b; CDC, 2009a).

Patient Characteristics

Patient sex, race, and ethnicity were based on information on the medical record or observation or knowledge of the patient. Patient sex, race, and ethnicity were imputed by National Center for Health Statistics staff in the 2005-2010 NAMCS and NHAMCS (CDC, 2010a; CDC, 2010b) were used in this study.

Sex. Sex was coded 1 = Female and 0 = Male.

Race/ethnicity. Ethnicity refers to a person's national or cultural group. The imputed race/ethnicity variable described in this study was coded as 1= Non-Hispanic White, 2 = Non-Hispanic Black, 3 = Hispanic, 4 = Asian, 5 = Native Hawaiian/Other Pacific Islander, 6 = American Indian/Alaska Native, and 7 = Multiple Races. However, because this variable did not meet reliability criteria (described in the Analysis section), the race variable described next was used to calculate population estimates.

Race. Race was collapsed and coded as 1 = White (A person having origins in any of the original peoples of Europe, the Middle East or North Africa), and 2 = Black or Other (Black

refers to a person having origins in any of the black racial groups of Africa. Other referred to Asian, Native Hawaiian/Other Pacific Islander, and American Indian/Alaska Native).

Age. Patient age in years was derived from patient date of birth.

Expected source of payment. Sources of payment were coded 1 = Private insurance, 2 = Medicare, 3 = Medicaid or Medicaid/SCHIP, 4 = worker's comp, 5 = self-pay, 6 = No charge, 7 = Other, and 8 = Unknown. Because this variable did not meet reliability criteria, the item on private insurance coded as 1 = Yes and 0 = No was used to calculate national estimates of expected source of payment.

Visit Characteristics

Physician's diagnosis. Diagnoses were coded according to the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) (CDC, 2013). Up to three diagnoses were collected from the provider. In the present study, medical visits were considered PCOS-related if they had a medical code of 256.4 on any of the three provider diagnoses.

Depression. In addition to the diagnoses described above, the provider also indicated the presence or absence of other conditions at the time of the visit. One of these conditions was depression. Depression was defined in NAMCS and NHAMCS OPD documentation as affective disorders and major depressive disorders, such as episodes of depression reaction, psychogenic depression, and reactive depression. Absence of depression at the time of the visit was coded 0 = No and presence of depression as 1 = Yes (CDC, 2012c).

Depression screening exam. This item indicated whether a depression screening was ordered or provided at the time of the visits and was coded as 0 = No, 1 = Yes.

Psychotherapy ordered or provided. Psychotherapy refers to all treatments involving the intentional use of verbal techniques to explore or alter the patient's emotional life in order to effect symptom reduction or behavior change. Psychotherapy ordered or provided was coded as 0 = No, 1 = Yes.

Other mental health counseling. Other mental health counseling refers to general advice and counseling about mental health issues and education about mental disorders. This includes referrals to other mental health professionals for mental health counseling (CDC, 2010a; CDC, 2010b).

Mental health provider seen. Mental health provider refers to psychologists, counselors, social workers, and therapists who provide mental health counseling, excluding psychiatrists (CDC, 2007a; CDC, 2009a).

The following types of health education ordered or provided at the visit were included in this study. Health education ordered or provided was coded 0 = No, 1 = Yes.

Family planning/contraception. Information given to the patient to assist in the conception or intended to help the patient understand how to prevent conception.

Growth/development. Any topics related to human growth and development.

Stress management. Information intended to help patients reduce stress through activities such as exercise, biofeedback, and yoga. It also includes referrals to other health professionals for the purpose of coping with stress.

Tobacco use/exposure. Information given to the patient on issues related to tobacco use in any use/exposure form, including cigarettes, cigars, snuff, and chewing tobacco, and on the exposure to tobacco in the form of "secondhand smoke." This also includes information on

smoking cessation and prevention of tobacco use as well as referrals to other health professionals for smoking cessation programs.

Sociogeographic Characteristics.

Starting in 2006, patient zip code in NAMCS and NHAMCS was used with data from the 2000 Census to determine education, income, and poverty measures (CDC, 2006a; CDC, 2006b). In the public use files, income and education data were categorized in quartiles and poverty level was grouped in percentages as follows:

Income. Median household income in patient's zip code of residence was coded 1 = Quartile 1 ($32,793 or less), 2 = Quartile 2 ($32,794-$40,626), 3 = Quartile 3 ($40,627-$52,387), and 4 = Quartile 4 ($52,388 or more).

Poverty level. Percent of population in patient's zip code below the poverty level was coded 1 = Quartile 1 (Less than 5.00%), 2 = Quartile 2 (5.00-9.99%), 3 = Quartile 3 (10.00-19.99%), and 4 = Quartile 4 (20.00% or more).

Bachelor's degree. Percent of population with a bachelor's degree or higher in patient's zip code of residence (CDC, 2012c).

Analyses

2005 to 2010 NAMCS and NHAMCS ED and OPD data were combined to produce national estimates of PCOS-related ambulatory medical care in the U.S. Analyses were conducted using Stata 13.1 using complex survey commands (StataCorp., 2013). Patient sampling weights were used to obtain national estimates of patient visits from 2005 to 2010. The estimated average annual number of patient visits was obtained by dividing the weighted total estimate of patient visits by 6, the number of years of survey data used. The "svyset" command in Stata was used to define the complex sample design and sampling weights. Between 2005 and

2010, all PCOS-related visits were made by 11 to 60 year-old females. To conduct analyses on this subpopulation, dummy variables indicating the desired subpopulation (11 to 60 year-old females) were created, and the "subpop( )" function was used to identify the desired subpopulation. This option takes into consideration the entire data set in Stata, identifies the full complex sample design, and performs analyses on the desired subpopulation of data. The "svy: mean" command was used to compute the estimated mean patient ages and standard errors for PCOS and non-PCOS-related visits. The "lincom" command was used after this to test for a difference in mean age for these two subgroups, while still accounting for the complex design and sampling. The "svy: tabulate" command was used to derive the percentage distributions of PCOS and non-PCOS-related visits by patient and visit characteristics as well as the associated standard errors. The Rao-Scott chi-square test was used to test for relations between visit type (PCOS and non-PCOS-related visits) and patient age, race, private insurance, and geographic characteristics, to account for the complex sampling design. An alpha level of .05 was the criterion for statistical significance.

The population estimates reported in this study met National Center for Health Statistics, Centers for Disease Control criteria that estimates be based on at least 30 unweighted records and weighted estimates have a relative standard error of less than 30% to be considered reliable (CDC, 2012d). Relative standard error is calculated by dividing the standard error of the estimate by the estimate itself, then multiplying that result by 100. Relative standard error is expressed as a percent of the estimate. For example, if the estimate of White patients seen for PCOS-related visits is 70% and the standard error of the estimate is 6%, the RSE of the estimate = (6/70)*100, or 8.6%. Categories of the race and geographic characteristics variables were collapsed to meet reliability criteria. Due to the limited sample size for PCOS-related visits,

further adjusted multivariate analyses were not conducted, as these would have made these estimates unreliable.

Even after combining multiple years of data, the following items on mental health and education ordered or provided did not meet reliability criteria: depression screening ordered or provided, depression diagnosis at the time of the visit, psychotherapy ordered or provided, mental health care provider seen, other mental health counseling ordered or provided, and health education ordered or provided in the areas of family planning/contraception, growth/development, stress management, and tobacco use/exposure.

Results

Between 2005 and 2010, there were 246 unweighted medical records (out of 590,772 total unweighted records) that had a diagnostic code of PCOS. These 246 visits represented 3,526,716 weighted visits, compared to 2,501,394,663 non-PCOS-related visits. The mean yearly rate of PCOS-related visits was 587,786 visits, that is 306 per 100,000 women ages 11 to 60 years old.

Patient Sociodemographic Characteristics

PCOS-related visits were largely by patients who were younger, on average ten years younger, than patients seen for non-PCOS-related visits. There was a marginally significant relation between visit type and patient race. A larger proportion of White patients (86.9%) were seen for PCOS-related visits than Black or Other patients (13.1%). There was also a significant association between visit type and private insurance payment. A greater proportion of PCOS-related visits were paid with private insurance (82.9%) compared to no private insurance (17.1%) (see Table 2.1).

Table 2.2 shows the unweighted descriptive statistics for patient race/ethnicity and payment type that did not meet National Center for Health Statistics reliability criteria of at least 30 unweighted records and relative standard error of less than 30%.

Patient Sociogeographic Characteristics

There was a significant association between visit type and percent poverty level in the patient's zip code. A greater proportion of PCOS-related visits were largely by patients living in zip codes with percent poverty level greater than 10%, compared to patients living in zip codes with percent poverty less than 10%. In contrast, a greater proportion of patients seen for non-PCOS-related visits were living in zip codes where percent poverty was less than 10%.

There were no statistically significant associations between visit type and median household income in patient's zip code or between visit type and percent population with a Bachelor's Degree or higher in the patient's zip code. Table 2 shows the population estimates for patient sociogeographic characteristics that did not meet reliability criteria.

Medical Visit Characteristics

Table 2.3 shows uweighted descriptive statistics of mental health and mental health care services and health education ordered or provided among females ages 11 to 60 years seen for PCOS-related visits. Items coded "Yes" did not meet reliability criteria. These items were depression screening ordered or provided, depression diagnosis at the time of the visit, psychotherapy ordered or provided, mental health care provider seen, other mental health counseling ordered or provided, and health education ordered or provided in the areas of planning/contraception, growth/development, stress management, and tobacco use/exposure.

Discussion

To my knowledge, this study is the first to describe patient sociodemographic and sociogeographic characteristics, mental health care services, and psychosocial health education ordered or provided at PCOS-related visits using national health care data. The findings suggest potential disparities in PCOS-related health care access and utilization by age, race, insurance type, and percent poverty greater than 10% in the patient's zip code.

Patient Sociodemographic Characteristics

While PCOS is described as one of the most common endocrine disorders in women of reproductive age (NIH, 2012), the ages of patients seen for PCOS-related visits (11-60 year-olds) in this study reflect the health needs of patients with PCOS across the life span (Goverde, Westerveld, Verhulst, & Fauser, 2008; Teede, Deeks, & Moran, 2010). Lack of knowledge or training among health care providers to deliver care to patients transitioning from one period in the life course to another can result in delayed transitions in care (Peters & Laffel, 2011). The finding that patients seen for PCOS-related visits were significantly younger than patients seen for non-PCOS-related visits is consistent with Jason's (2011) findings. This suggests that health services to manage PCOS and prevent its complications in later life are particularly important, not only among women of reproductive age, but also among children, adolescents, and women post menopause.

The finding that the proportion of PCOS-related visits paid with private insurance was more than four times greater than PCOS-related visits paid without private insurance mirrors national trends associated with payment type and health care access and utilization. For instance, according to the National Healthcare Disparities Report, people with private insurance are about twice as likely to have a specific source of ongoing care compared to the uninsured (HHS, 2013).

Continuous access to quality, affordable health services is especially important for patients with a chronic condition such as PCOS that requires long-term monitoring and care. For instance, patients in emerging adulthood (22-30 year-olds) with a chronic condition and public or no health insurance in the U.S. are more likely to experience delayed transitions in care, from pediatric to adult health care providers (Fortuna et al., 2012), resulting in poorer health outcomes. In this study, the limited sample of PCOS-related visits paid with public insurance including Medicaid and the State Children's Health Insurance Program restricted the ability to calculate reliable population estimates for these groups.

The proportion of PCOS-related visits made by Black and Other patients was about six times lower than the proportion of White patients. This is concerning as racial and ethnic minority women may be more susceptible to PCOS and its complications, compared to White women. For instance, Black women with PCOS tend to have high rates of obesity and hypertension, followed by Hispanic women; yet, screening for metabolic disorders (e.g., obesity, high cholesterol, blood pressure, and type 2 diabetes) among racial and ethnic minority women, and women with PCOS in general, tends to be low (Mott, Kitos, & Coviello, 2014). Larger sample sizes of PCOS-visits and racial and ethnic minority patients are necessary to further examine differences in PCOS-related visits for diverse racial and ethnic groups such as those described in Table 2.2. Indeed, reviews of existing data sources find that larger national sample sizes are necessary to identify health disparities for major racial, ethnic, and socioeconomic subgroups (Bilheimer & Klein, 2010). As researchers involved in developing the first National Healthcare Disparities Report stated, "Disparities in data available to assess the health care of different racial, ethnic, and socioeconomic groups compound the problem of disparities in access to and quality of care." (Moy, Arispe, Holmes, & Andrews, 2005, p. I-15).

Patient Sociogeographic Characteristics

The finding that patients seen for PCOS-related visits tended to live in zip codes with percent poverty greater than 10% points to an important area for future research. Factors such as poverty, poor housing, and inadequate health and social services can lead to poor health; and as a result, poor health can be a marker of social disadvantage (Bywaters, 2007). For instance, neighborhood characteristics have been found to influence African-American women's risk of type 2 diabetes. That is, women with the lowest neighborhood socioeconomic status (SES) (measured by Census data on education, income, and wealth) have lower individual SES and poorer health outcomes such as higher mean body mass index and family history of diabetes, compared to women with the highest neighborhood SES. The association of neighborhood SES with type 2 diabetes is statistically significant even among women with high individual levels of SES (college-educated women and women with a family income greater than $50,000 year), suggesting that these women are also susceptible to the influence of disadvantaged neighborhoods (Krishnan, Cozier, Rosenberg, & Palmer, 2010).

Lack of statistically significant differences in the proportion of PCOS-related visits by median household income in the patient's zip code and in the percent population with bachelor's degree or higher in the patient's zip could be due to collapsing quartiles to meet reliability criteria. Collapsing quartiles could have masked differences between the lowest and highest quartiles. The influence of community and neighborhood characteristics on PCOS-related health care need to be examined in greater depth, particularly as the literature on the influence of education and income on women's risk of PCOS has focused on individual and parental education and income. For instance, low SES in childhood (measured by parental education) has

been found to increase risk of PCOS in adulthood (measured by educational level), particularly among obese women with high SES in adulthood (Merkin et al., 2011).

Visit Characteristics

The number of unweighted records with a diagnosis of PCOS in this study (n = 246) is within range of the number of PCOS-related records Jason (2011) found (n = 175) using 2003-2008 NAMCS and NHAMCS data (Jason, 2011). Jason (2011) was unable to calculate national estimates of PCOS-related visits in which the patient also had a diagnosis of diabetes because these data did not meet National Center for Health Statistics reliability criteria of at least 30 unweighted records and a relative standard error of less than 30%. In the present study, items on mental health services and health education ordered or provided did not meet reliability criteria. As a result, precise and reliable national estimates of PCOS-related mental health services and health education ordered or provided could not be calculated, illustrating the issue of suppressed data.

Suppressed data refers to data not reported due to its inability to meet criteria based on cell size and relative standard error to provide reliable estimates (Moy et al., 2005). Reports that evaluate the country's progress in addressing health and health care disparities, such as the National Healthcare Disparities Report and Healthy People, suppress such data (Klein, Proctor, Boudreault, & Turczyn, 2002; Moy et al., 2005; HHS, 2013). Effective data collection is an important part of ensuring that people's health and mental health needs are met (Gask et al., 2009). Developing surveillance systems to assess the comorbidity and severity of mental health problems and health service use associated with PCOS is a major step in addressing this major public health problem for women. Effective surveillance systems should have sufficiently large

sample sizes, even after combining multiple years of data, to make national estimates and conduct analyses of subgroups (Brown, 2008).

The present study underscores the need to strengthen national surveillance to further understand PCOS-related mental health services and health education to improve behavioral health care for patients with PCOS. Increased attention on PCOS research may lead to inclusion of PCOS-related items in national health surveys and larger sample sizes of PCOS-related visits in national health care surveys. For instance, as a result of a partnership between the National Center for Health Statistics and the Health Resources and Services Administration, NAMCS oversampled community health centers for the first time in 2006 (Shi et al., 2010). The oversampling increased the reliability of estimates for visits to community health centers and led to important findings regarding the demographic characteristics of patients visiting community health centers (Hing & Hooker, 2011; Hing, Hooker, & Ashman, 2011; Shi et al., 2010). For instance, visits to community health centers tend to be made by poor patients or patients receiving public insurance such as Medicaid and State Children's Health Insurance Program (SCHIP), uninsured patients, patients under 45 years of age, and ethnic minority groups. Efforts to collect PCOS data on a large scale is also likely to require the support and endorsement of groups knowledgeable about PCOS research and practice. For instance, in 2010 NAMCS began collecting data on blood glucose and other laboratory tests related to cardiovascular disease after the American Heart Association released a scientific statement recommending these data be collected to track progress of heart disease and stroke prevention and management. Including these items in NAMCS provided "a low-cost approach to enhance national surveillance for cardiovascular disease" (CDC, 2010a, p. 116).

Mental Health Care Services

This study's results highlight the importance of further understanding mental health services, including depression and depression screening, among patients seen for PCOS-related visits. Depression screening can prompt intervention to improve emotional well-being, motivation, and self-efficacy necessary to make lifestyle changes and manage PCOS (Jean Hailes Foundation for Women's Health [Jean Hailes], 2011). International groups such as the Endocrine Society, an organization that aims to foster a greater understanding of endocrinology among the general public and practitioners (Endocrine Society, 2014), recommends screening adolescents and women with PCOS for anxiety and depression and providing appropriate referral or treatment (Legro et al., 2013). Additionally, the U.S. Preventive Services Task Force recommends that women, people with chronic diseases and those of low socioeconomic status, be screened for depression, as these groups tend to be at greater risk of developing depressive symptoms. The Task Force recommends screening adults in primary care settings where resources and support are in place to accurately diagnose, effectively treat, and follow-up with patients that screen positive for depression (United States Preventive Services Task Force, 2009). The benefits of depression screening should outweigh the risks, and screening programs should be evaluated on process, follow-up, and effectiveness (Oleckno, 2008).

Further research on depression diagnosis, treatment, and follow-up of adolescents and women with PCOS can inform clinical guidelines and mental health services for patients in the U.S. For instance, in 2008, the PCOS Australian Alliance; a group composed of health care providers, researchers, and consumer groups in Australia developed the first national evidence-based guidelines for the assessment and management of PCOS (Jean Hailes, 2011, Jean Hailes,

2015), which the NIH has cited as a model for the U.S. to follow (NIH, 2012). The guidelines are available at https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ext_2_ext_0002.pdf. To date, these guidelines provide the most comprehensive recommendations for assessing emotional well-being associated with depression, anxiety, and other areas that can be overlooked or untreated among patients with PCOS. The guidelines recommend health care providers routinely screen patients with PCOS for depression and anxiety, and when appropriate, refer the patient to an appropriate professional for further mental health assessment (Jean Hailes, 2011). Additionally, the guidelines stress the importance of collaborative care in treating PCOS by stating: "Access to appropriately trained and experienced health professionals will be required. It is the responsibility of all health professionals to understand the impact of PCOS on psychological health and to screen for and manage these disorders." (Jean Hailes, 2011, p. 55).

Health Education Ordered or Provided

Understanding diverse types of health education ordered or provided at PCOS-related visits is important because women have expressed strong interest in non-medication treatment for PCOS (Sills et al., 2001). Jason (2011) found that a greater proportion of health education in diet and nutrition was ordered or provided at PCOS-related visits, compared to non-PCOS-related visits. In the present study, the sample sizes of other types of health education ordered or provided were insufficient to compare to those ordered or provided at non-PCOS-related visits. Nevertheless, this study highlights that patients seen for PCOS-related visits were ordered or provided with diverse types of health education in the areas of family planning/contraception, growth/development, stress management, and tobacco use/exposure. These findings suggest that an approach involving diverse health care providers is needed to address the complex needs of

patients seen for PCOS-related visits. In fact, research suggests that an approach involving providers in endocrinology, gynecology, health psychology, and nutrition tends to be efficient and thorough in addressing the diverse needs of adolescent patients with PCOS. Health psychologists, for instance, have been found to use motivational interviewing to identify and problem-solve barriers to lifestyle changes among patients with PCOS (Bekx, 2010). Another reason to further examine health education associated with PCOS is that health education, combined with individualized treatment plans, has been found to influence patient motivation to implement lifestyle changes to prevent health risks associated with PCOS and increase satisfaction with health care providers (Colwell, Lujan, Lawson, Pierson, & Chizen, 2010). Issues to consider when delivering patient education for PCOS include the cost-effectiveness of these approaches and ways to reduce barriers to patient education (Behrens, Wiczyk, Wyckoff, & Waite, 2007).

This study also had some limitations. First, as Jason (2011) noted, the diagnostic code for PCOS may not have captured unrecognized cases of PCOS (Jason, 2011). For instance, the lack of standardized, universal criteria for diagnosing PCOS can lead to inconsistencies and delays in diagnosis. According to the 2012 NIH Evidence-based Methodology Workshop on PCOS, "The use of multiple classification systems is confusing and delays progress in understanding the syndrome. It also hinders the ability of clinicians to partner with women to address and manage the health issues that concern them." (NIH, 2012, p. 2). Even when diagnoses are accurate, there appears to be reluctance in finalizing the diagnosis among younger patients, particularly when PCOS symptoms mirror those occurring in puberty. In such cases, for instance, Powers et al. (2014) note that a qualifier like "probable," "likely," or "possible" tends to describe the diagnosis, reflecting a reluctance among physicians to label girls and young

women with PCOS at an early age, or due to uncertainty that clinical signs (e.g., irregular menses) are abnormal when occurring near the onset of menstruation (Powers et al., 2014, p. 8).

A second limitation is related to health services ordered or provided. Health education or mental health services ordered may not have been provided at the time of the visit; however, these items capture an intent to provide these services (Schmitt, Miller, Harrison, & Touchet, 2010). Previously published research has also raised the possibility of underreporting of behavioral health counseling in NAMCS (Gilchrist, Stange, Flocke, McCord, & Bourguet, 2004). That work compared direct observations of medical visits to physicians with data reported by physicians in the 1993 NAMCS. The study found good agreement between reporting of diagnostic procedures and exams (e.g., pap tests, cholesterol test orders) in NAMCS and in direct observations. However, there were some discrepancies in reporting of behavioral health counseling in NAMCS compared to direct observations. For instance, there was fair agreement on alcohol, substance abuse, and diet counseling; moderate agreement on family planning and exercise counseling; and very good agreement on smoking counseling (Gilchrist et al., 2004). As other researchers have pointed out, the results of that study cannot be generalized to research with NAMCS data from other years involving different items, particularly items added to NAMCS after 1993 (Schmitt et al., 2010) such as depression screening ordered or provided and diagnosis of depression at the time of the visit first introduced in the 2005 NAMCS. Nevertheless, results of research with the 1993 NAMCS raised an important issue; the possibility that limited reimbursement for counseling services could influence underreporting of behavioral counseling (Gilchrist et al., 2004). Indeed, research conducted by the Substance Abuse and Mental Health Services Administration, Health Resources and Services Administration, and Centers for Medicare and Medicaid Services has identified lack of

reimbursement for mental health services as one of several barriers to the provision of mental health services in primary care settings (Kautz, Mauch, & Smith, 2008). Future research should examine whether such issues create barriers to the delivery of behavioral health services for patients seen for PCOS-related visits.

Third, NAMCS and NHAMCS data are visit based rather than population based, and theoretically, the same patient can make more than one medical visit during the data collection period for the same problem and be selected into the sample each time (CDC, 2012d). As a result, these data cannot be used to calculate PCOS incidence or prevalence. However, the purpose of this study was not to calculate PCOS incidence or prevalence, but rather to describe the patients that utilize physician services and hospital outpatient and emergency department services and the diagnostic and therapeutic services provided care surveys, which is the intent of the national health care surveys (CDC, 2012a).

Conclusion

The findings underscore the importance of strengthening national surveillance to further understand behavioral health services for patients seen for PCOS-related visits. This can increase our understanding of potential disparities in PCOS-related health care access and utilization. While the implementation of the Affordable Care Act has the potential to reduce disparities in coverage, particularly for low-income and racial and ethnic minorities eligible for Medicaid expansion (United States Centers for Medicare & Medicaid Services, 2015), it is important to keep in mind potential barriers to the inclusion of items on PCOS, behavioral health care, and patient characteristics in national monitoring surveillance systems. For instance, a new item may not be added to the health care surveys without a sponsoring agency to fund the additional items or if no expert meeting recommends the addition of items. Additionally, the use

of paper surveys means that an item will likely be omitted if a new item is to be added because the paper format limits the total number of items that can be collected (CDC, 2014).

The findings can also inform collaborative care, a promising approach to treating the comorbidity of mental illness and chronic disease. Collaborative care is a team approach that involves a greater role of nonmedical specialists, such as case managers with a mental health background, in managing chronic disease in primary care (Gilbody, Bower, Fletcher, Richards, & Sutton, 2006). Compared to standard care, collaborative care has been effective in treating depression among patients with chronic disease such as diabetes, including low-income and ethnic minority groups (Katon, Unützer, Wells, & Jones, 2010). Innovative models of care in which social workers, psychiatrists and obstetricians/gynecologists integrate depression care into obstetric and gynecological care (LaRocco-Cockburn et al., 2013), also appear to be promising approaches for improving the quality of mental health treatment in settings where women receive care, including PCOS-related care. Developing collaborative, integrative, and team-based models in health care is necessary in light of the Affordable Care Act's promotion of team based care in which clinical and non-clinical staff (e.g., behavioral and community health workers, patient navigators) work as a team to provide high quality care by following up with patients, providing medication instruction, and aiding in symptom management (Patel & Masi, 2015).

Table 2.1. Patient Sociodemographic and Sociogeographic Characteristics: Comparisons between PCOS- and non-PCOS-related Visits in the U.S. among Females Ages 11 to 60 years, 2005-2010

	PCOS-related Visits				**non-PCOS-related visits**				
	Visit Sample Frequency	Weighted Average Visits per Year	% Visits Per Year	Relative Standard Error (%)	Visit Sample Frequency	Weighted Average Visits per Year	% Visits Per Year	Relative Standard Error (%)	**p-value***
Patient Sociodemographic Characteristics									
Age (years)	(Mean = 28.3, SD = 7.0)				(Mean = 38.2, SD = 14.4)				**p<.001**
Race									**p<.10**
White	197	510,996	86.9	3.8	438,002	333,750,364	80.1	1.2	
Black or Other	49	76,790	13.1	25.4	149,349	83,148,747	19.9	4.9	
Payment Type									
Private insurance ***									**p<.001**
Yes	158	487,224	82.9	4.9	261,794	268,279,260	64.4	1.0	
No	88	100,562	17.1	23.6	325,557	148,619,851	35.6	1.8	
Geographic Characteristics									**p=0.0450**
Percent poverty in patient's zip code **									
< 10%	97	157,294	38.1	18.5	208,370	170,831,626	52.0	3.0	
≥ 10%	103	255,238	61.9	11.4	263,506	157,411,429	48.0	3.2	
Median household income in patient's zip code									p=0.5708
≤ $40,626	96	179,387	43.5	14.7	254,822	154,079,470	46.9	3.2	
≥ $40,627	104	233,146	56.5	11.3	217,121	174,217,619	53.1	2.9	
Percent pop. w/ bachelor's degree or higher in patient's zip code									p=0.5596
≤ 19.66%	94	184,358	44.7	15.4	250,784	160,201,707	48.8	2.6	
≥ 19.67%	106	228,175	55.3	12.4	220,926	168,052,693	51.2	25	

***** Statistically significant *p*-values for Rao–Scott chi-square test in bold

Table 2.2. Unweighted Descriptive Statistics of Patient, Visit, and Sociogeographic Characteristics among Females Ages 11 to 60 years seen for PCOS-related Visits, 2005-2010

	PCOS-related Visits		
	Visit Sample Frequency	% Visits	Standard Error
Patient Sociodemographic Characteristics			
Race/Ethnicity			
Non-Hispanic White	**117**	**70.2**	**5.8**
Non-Hispanic Black	16	10.7	4.6
Hispanic	22	12.6	3.7
Asian	5	5.0	2.7
Native Hawaiian/Other Pacific Islander	4	0.9	0.8
American Indian/Alaska Native	1	0.6	0.6
Multiple Races	3	0	0
Payment type			
Private insurance	**158**	**83.3**	**4.0**
Medicare	0	0	9.0
Medicaid/SCHIP	49	9.0	3.2
Worker's compensation	0	0	0
Self-pay	19	2.7	1.3
No charge	5	1.0	0.6
Other	7	2.4	1.4
Unknown	4	1.6	1.4
Patient Sociogeographic Characteristics			
Percent poverty in patient's zip code			
Quartile 1 (Less than 5%)	39	13.5	4.8
Quartile 2 (5 to 9.99%)	**58**	**24.7**	**5.4**
Quartile 3 (10 to 19.99%)	**72**	**50.3**	**7.8**
Quartile 4 (20% or more)	31	11.5	5.4
Median household income in patient's zip code			
Quartile 1 (Below $32,793)	42	12.2	3.8
Quartile 2 ($32,794-$40,626)	**54**	**31.3**	**6.3**
Quartile 3 ($40,627-$52,387)	**56**	**35.2**	**6.1**
Quartile 4 ($52,388 or more)	**48**	**21.3**	**5.2**
Percent population with Bachelor's Degree or higher in patient's zip code			
Quartile 1 (Less than 12.84%)	45	18.7	6.5
Quartile 2 (12.84 to 19.66%)	**49**	**26.0**	**6.2**
Quartile 3 (19.67 to 31.68%)	**61**	**36.2**	**6.6**
Quartile 4 (31.69% or more)	**45**	**19.1**	**4.7**

Note: Estimates in bold meet National Center for Health Statistics reliability criteria (estimates based on greater than 30 unweighted records and a relative standard error of 30% or less).

Table 2.3. Unweighted Descriptive Statistics of Mental Health and Mental Health Care Services and Health Education Ordered or Provided among Females Ages 11 to 60 years seen for PCOS-related Visits, 2005-2010

	PCOS-related Visits		
	Visit Sample Frequency	% Visits	Standard Error
Mental Health Care Services			
Depression screening ordered or provided			
Yes	6	3.5	2.1
No	**231**	**96.5**	**2.1**
Depression diagnosis at the time of the visit			
Yes	23	14.1	5.0
No	**214**	**85.9**	**5.0**
Psychotherapy ordered or provided			
Yes	4	3.2	2.3
No	**233**	**96.8**	**2.3**
Mental health provider seen			
Yes	1	0.2	0.2
No	**155**	**99.8**	**0.2**
Other mental health counseling ordered or provided			
Yes	2	0.7	0.6
No	**235**	**99.3**	**0.6**
Health Education Ordered or Provided			
Family planning/contraception			
Yes	7	14.1	6.6
No	**68**	**85.9**	**6.6**
Growth/development			
Yes	4	5.3	3.5
No	**233**	**94.7**	**3.5**
Stress management			
Yes	8	0.7	0.5
No	**229**	**99.3**	**0.5**
Tobacco use/exposure			
Yes	11	4.5	2.0
No	**226**	**95.5**	**2.0**

Note: Estimates in bold meet National Center for Health Statistics reliability criteria (estimates based on greater than 30 unweighted records and a relative standard error of 30% or less).

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Chapter 3

"Less Than A Wife": PCOS Content in Teen and Women's Digital Magazines

Abstract

Background and Purpose: Teen and women's magazines are a type of entertainment-education that publish health content alongside beauty, fashion, and entertainment content. These media have the potential to expose primarily female readers to content on PCOS and influence readers' beliefs, attitudes, and behavior. This study is the first to explore how digital (online) teen and women's magazines portray women with PCOS to understand the discourse and ideologies related to health, illness, and gender in these media.

Methods: The Alliance for Audited Media was used to identify teen and women's magazines with circulation rates of 1,000,001 and greater. Magazines with circulation rates 100,001-1,000,000 were also selected to include magazines directed toward racial and ethnic minority readers that may not have had the highest circulation rates. Two researchers independently searched each of the magazine websites over a one month period in 2015 and identified articles containing keywords "PCOS" and "polycystic ovary syndrome". This yielded a total of 21 magazines (e.g., Glamour, Cosmopolitan en Español, O' The Oprah Magazine, and Essence) and 155 articles containing the keywords. Magazine media kits were retrieved from publisher's websites to obtain readership demographics. Two coders used a grounded-theory approach to coding using an open coding of magazine articles to identify themes. Articles were read repeatedly and inductively and new themes were noted when observed. The units of analysis were the magazine article, title, caption, and user comments. Peer debriefings were held to discuss and reconcile themes.

Findings: Adolescents and women with PCOS were depicted as feeling ignored and dismissed by health care providers. Articles largely placed personal responsibility on women to improve their health through self-efficacy and control of lifestyle choices. Shame and embarrassment associated with PCOS symptoms like excessive facial hair led women to hide symptoms to conform to social ideals of beauty and femininity. PCOS-related infertility hindered and interrupted women's social roles and responsibilities as wives and mothers (e.g., childbearing). To a lesser extent, articles portrayed women as using their personal experiences with PCOS to advocate for women's health. In some instances, magazines attempted to challenge dominant discourses of beauty and femininity, albeit within the confines of gender norms.

Conclusions and Implications: The findings underscore the importance of educating readers of digital women's magazines to be critical consumers of health media. This study can inform the development of health education programs for consumers, particularly women of diverse racial and ethnic backgrounds, ages, and socioeconomic status, who read about PCOS content in digital women's magazines. This study also has implications for the potential, strategic use of digital women's magazines to promote women's health.

Keywords: polycystic ovary syndrome, digital magazines, health, gender

In the United States, thirty five percent of adults, or about one in three Americans, have used the internet to figure out what medical condition they or someone else might have. Internet users also search for information on a medical treatment or procedure, medical test results, and how to lose or control weight, among other topics (Fox & Duggan, 2013). Younger age groups and women increasingly use the internet and social media to access health-related information (Atkinson, Saperstein, & Pleis, 2009; Chou, Hunt, Beckjord, Moser, & Hesse, 2009).

Among the people searching for health-related information online are women typing "PCOS", "polycystic ovaries syndrome", and "PCOS symptoms" (Mousiolis, Michala, & Antsaklis, 2012, p. 44). Women with PCOS describe the process of searching for answers to their symptoms as emotional, confusing, frustrating, and devastating (Snyder, 2006), and in addition to seeing several doctors before receiving a diagnosis, women report diagnosing themselves by searching for information online (Crete & Adamshick, 2011). Information on PCOS is on social networking sites, government health and professional associations, and nonprofit organizations, among other websites (Dean, 2011; Mousiolis et al., 2012). Women may search the internet for information on PCOS they cannot find or understand in books or other print sources (Avery & Braunack-Mayer, 2007). Additionally, the internet provides women with a convenient, private, and accessible way to access information on symptoms such as obesity and hirsutism (excessive hair) that may be too embarrassing to discuss in person. Women also communicate and share experiences with PCOS via chat groups, email lists (Avery & Braunack-Mayer, 2007), and social networking sites like Facebook and Twitter (Mousiolis et al., 2012).

Research on online information about PCOS has primarily focused on coverage and accuracy of this coverage. For instance, findings suggest there is a range of online resources on

PCOS (Dean, 2011; Mallappa Saroja & Hanji Chandrashekar, 2010), and that there is variation among websites regarding PCOS symptoms, long-term health effects, and management strategies (Mallappa Saroja & Hanji Chandrashekar, 2010; Mousiolis et al., 2012). Websites also tend to omit information on authors, editorial review process, publication date, strength of evidence reported (e.g., use of randomized controlled trials), PCOS treatment based on practice guidelines (Mallappa Saroja & Hanji Chandrashekar, 2010), privacy and confidentiality of personal data, and sources of information published (Mousiolis et al., 2012).

Media does not just provide consumers with health information, however, it also creates social constructions of health, illness, and medical care that have implications for how consumers view and manage their health (Kline, 2011). For instance, teen and women's magazines tend to conflate health and beauty (Chamberlain & Madden, 2004; Newman, 2007). Ballentine and Ogle's (2005) analysis of body-related content published from 1993 to 2003 in Seventeen, a magazine for adolescent girls, found that content created constructions of desirable bodies as lean, toned, and free of hair and acne (Ballentine & Ogle, 2005). Equating health with beauty can be problematic for readers with PCOS. For instance, teen magazines publish techniques such as hair removal strategies and quick-fix diet and exercise routines readers can follow to achieve the desirable body (Ballentine & Ogle, 2005). Hair removal techniques that do not address the underlying causes of excessive hair growth can mask the severity of PCOS-related hirsutism (Keegan, Liao, & Boyle, 2003). Diet and exercise routines to achieve the desirable body in a short amount of time (Ballentine & Ogle, 2005), and the underrepresentation of female athletes and women in sports in popular teen magazines (Daniels, 2009), can overlook the importance of long-term lifestyle changes in diet and physical activity needed to manage PCOS. On the other hand, content in women's magazines encouraging women to collaborate

with health care providers, be cautious about treatment and medications, and look to friends, family, and support groups for social support (Barnett, 2006), may help readers manage their health.

Magazines are a type of entertainment-education or "edutainment", which refers to the placement of educational content in entertainment messages (Singhal & Rogers, 2002). Magazines publish health content in addition to beauty, fashion, and entertainment content. For instance, teen magazines have published health content on topics such as sexually transmitted diseases, gynecological visits, birth control and human papilloma virus (Keller, 2011). Women's magazines have published on breast cancer, (Andsager & Powers, 2001), heart disease, osteoporosis, and depression (Barnett, 2006). Interestingly, there is evidence in the literature that magazine readers have come across content on PCOS. As an adolescent pointed out, "So I'm sitting inside the waiting room and I'm reading through and looking through magazines, and I came across an article in the Seventeen Magazine: Polycystic Ovary Disease. And a light bulb went off in my head. I'm like, hey, I gained weight for no reason. I have hair all over my face and it's popping up in places I don't want the hair to pop up. And so, I took it to my gynecologist and she was like, 'That's what you have'" (Snyder, 2006 p. 389). Research also suggests that women with PCOS relate information they see in the media to their health, as the following quote illustrates: "If you look at how the media portrays what is feminine, lack of body hair, thinness, and a beautiful complexion, you don't have these with PCOS and wish you did" (Snyder, 2006, p. 389).

While several health topics have been featured across a range of edutainment (Singhal & Rogers, 2002), researchers have not examined content on PCOS in teen and women's magazines. These media have the potential to expose primarily female readers to content on PCOS and

influence readers' beliefs and attitudes about women with PCOS. In particular, online magazines, also referred to as digital magazines, are capable of reaching large audiences due to the lower cost of production and distribution, compared to traditional print magazines (Santos Silva, 2011). This study explores how popular, digital teen and women's magazines portray adolescents and women with PCOS to understand the discourse and ideologies related to health, illness, and gender in these media. This study has implications for educating readers of digital women's magazines to be critical consumers of health media and the strategic use of digital women's magazines to promote women's health.

Method

Procedure

The Alliance for Audited Media was used to identify the highest circulating women's and teen magazines with digital editions published in the U.S. The Alliance for Audited Media (AAM) is a not-for-profit organization founded in 1914 (formerly known as the Audit Bureau of Circulation) that provides audited circulation figures, among other services and data, for newspapers, magazines, and digital media companies in the U.S. and Canada (Alliance for Audited Media, 2013). Advertising firms use these services and data to obtain details on various media types (e.g., magazines, newspapers) to most effectively reach target markets or audiences. AAM is also available to academic institutions with electronic subscriptions to AAM (Pittsley, 2014). Researchers, for instance, have used AAM to identify magazines and newspapers to study news media coverage of gun violence by individuals with serious mental illness (McGinty, Webster, Jarlenski, & Barry, 2014).

Consumer magazines with membership to AAM file publisher's statements with AAM every six months. Publisher's statements are claims made by consumer magazines that contain

information on the publication's field served and average circulation of print and digital issues. AAM defines field served as the publisher's description of the markets or occupations whose interest the editorial content is directed toward (Alliance for Audited Media, 2013). In other words, field served describes the publication's target audience or readership. Additionally, AAM defines digital edition circulation as the distribution of a magazine's content via electronic means. The digital edition maintains the same identity (e.g., same name and logo characteristics) of the host (or print) publication (Alliance for Audited Media, 2013).

The magazines used in this study were first selected based on circulation rates of 1,000,001 and greater. Second, publisher's statements were retrieved for the magazines that met circulation criteria. Magazines were selected for inclusion in this study if the publisher's statements' descriptions of the field served indicated the target audience or readership was women or female teens. This yielded a total of 24 magazines. Magazines with circulation rates 100,001-1,000,000 were also selected in an effort to include magazines catering to racial and ethnic minority readers who may not have had the highest circulation rates. Publisher's statements were also retrieved for these magazines, yielding 3 additional magazines whose target audience or readership was women or female teens.

Two researchers, the author and a research assistant, independently searched each of the magazine websites from January 22nd to February 25th, 2015 to identify articles containing the keywords "PCOS" and "polycystic ovary syndrome". Then, the researchers compared the websites and number of articles containing the keywords. This yielded a total of 21 magazines and a total of 155 articles containing the keywords. The magazines were Better Homes and Gardens, Cosmopolitan, Cosmopolitan en Español, Essence, Family Circle, Fitness, Glamour, Good Housekeeping, Health, MORE, O' The Oprah Magazine, Parenting, Parents, Prevention,

Redbook, Self, Shape, Teen Vogue, Vanidades, Woman's Day, and Women's Health. Two of these magazines, Essence and Teen Vogue, did not contain the keywords in articles, but rather in the reader comments. Table 3.1 lists the magazines included in the final sample, descriptions of the field served, and circulation rates for digital issues and total circulation rates (including print and digital issues).

The final 155 articles were imported into NVivo 10 for Windows using the NCapture for NVivo add-on in Google Chrome. NCapture is a web browser extension that captures web content (e.g., web pages) that can then be imported into NVivo 10 for Windows as PDF sources (QSR International, 2014). In one instance, there was a video embedded in a Redbook article that had no text in the article except for the article's title and caption. The video was a total of 2:51 minutes in length, and streamed directly on Redbook's site, rather than taking the reader to YouTube. The video was transcribed and the content was included in the analysis.

The two researchers independently coded each of the 155 articles to identify the following five primary content areas, that according to the literature, are published in women's magazines: medical advice, letters or advice, personal stories, advertisements, and visual imagery. Medical advice pieces discussed PCOS in terms of warning signs, treatment, and prognosis. Letters or advice columns were those where questions about PCOS were asked and answered. Personal stories or narratives were based on women's own experiences with PCOS. Advertisements included health products and services related to PCOS. Visual imagery included pictures of actual women with PCOS. We focused on the pieces containing medical advice, letters or advice, and personal stories or narratives.

Two independent coders, both women, used a grounded-theory approach to coding using an open coding of magazine articles to identify themes the data exhibited. The lead researcher

had background in psychology, social work, and public health. The graduate student research assistant, who was unfamiliar with the study aims, had background in social work and public health. Articles were read repeatedly and inductively, and new themes were noted when observed. The units of analysis were the magazine article, title, caption, and user comments. We held peer debriefings to discuss and reconcile the themes. This study focuses on themes related to women's experiences feeling ignored, personal experience as a catalyst for change, personal responsibility for one's health, self-efficacy and control, women's social roles and responsibilities, and beauty and femininity.

Finally, magazine media kits were retrieved from publisher's websites to obtain the demographic characteristics of magazine readers (Better Homes and Gardens, 2015, January 12; Cosmopolitan, 2014, Spring; Essence, 2015; Family Circle, 2013; Fitness, 2013, Fall; Glamour, 2014, August; Good Housekeeping, 2014, Spring; Health, 2013; MORE, 2014, November 11; MORE:, 2014, November 11; O' The Oprah Magazine, 2014a, Spring; O' The Oprah Magazine, 2014b, Spring; Parents, 2014; Prevention, 2014, June; Redbook, 2014, Spring; SELF, 2014, September; Shape, 2014; Teen Vogue:, 2014, December; Vanidades, 2013, Spring; Woman's Day, 2014, Fall; Women's Health, 2014, January). A media kit is a resource created by a publisher to help prospective ad buyers evaluate advertising opportunities (Doyle, 2011). Table 3.2 lists readership demographics. This study used publicly available data and was deemed Exempt from review by the University of Michigan Institutional Review Board.

Results

Feeling ignored, not taken seriously

Women’s magazines described PCOS as a condition that can go unrecognized due to lack of clear signs or symptoms pointing to a definitive diagnosis. Women were portrayed as

struggling to find answers to symptoms such as menstrual problems and weight gain, from the time they first sought medical help to years later when their symptoms worsened. The following piece published in Women's Health titled "Patient Care: Survive Your Doctor" depicts such an experience:

> "So, a woman walks into a doctor's office. She's 25, and her cramps are out of control; her period is irregular at best. What's more, she's packed on 50 pounds in 18 months. Her general practitioner suspects and tests her thyroid. Normal. She's shuffled to a gynecologist, who orders a raft of blood work. Normal again. She's prescribed Advil for the pain and birth-control pills to regulate her cycle. Back home, she takes to the Web, searching for answers. And at a followup visit with her gyno, she timidly offers a diagnosis of her own: polycystic ovary syndrome (PCOS), a hormonal disorder that plagues some 5 million young women. "Doubtful," says her doc. "You don't fit the profile." Though the classic PCOS patient is overweight, sufferers also have unnaturally high testosterone levels, something that's missing here. Besides, before her recent weight gain, she'd been slim and healthy, so she's likely just going through a normal postadolescent metabolic slowdown, says her M.D. She'll bounce back soon enough. Except that she doesn't—and two years later, after constant pain and countless more appointments, procedures, and tests, Alexa Stevenson of St. Paul, Minnesota, is finally correctly diagnosed by a reproductive endocrinologist with PCOS, the most common cause of infertility." (Moore, 2010, June 15)

In this scenario, Ms. Stevenson, initially sought treatment for cramps, irregular periods, and rapid or unexplained weight gain. A general practitioner tests her thyroid, a gland that can cause weight gain if the gland does not produce sufficient thyroid hormone (Mayo Clinic Staff, 2012). The story suggests that after seeing both the primary care provider and the gynecologist, Ms. Stevenson was dissatisfied with the lack of diagnosis and sought health information online. "Timidly" suggests she was hesitant and lacked courage or confidence to offer a diagnosis of PCOS to the gynecologist, whom she perceived as an expert and authority figure.

Medical advice articles also depicted women as feeling ignored by health care providers and encouraged women to be persistent in seeking medical care for PCOS, as in this piece titled

“Endometriosis and Polycystic Ovarian Syndrome: The Two Women’s Diseases Doctors Miss Most” published in Glamour.

> "We may not tell our ob-gyns about symptoms that seem simply cosmetic, like hair loss or skin tags (molelike flaps of tissue). The lesson: Share as many details with your doctor as you can, and if you feel you’re being ignored, see someone else or get a referral to a reproductive endocrinologist. Being persistent about getting good care is key, because left undiagnosed, PCOS may cause infertility and even lead to diabetes and heart disease." (Sklar, n.d.)

This piece anticipates that women may feel ignored by health care providers who are not aware of women’s full range of symptoms, particularly symptoms women do not disclose due to perceptions that these are simply cosmetic. The use of “ignored” suggests that women may experience loss of power or control over their health care when health care providers do not take notice of or attend to their symptoms. Therefore, the piece advises women to be “persistent” and seek health care providers, including specialists like reproductive endocrinologists, that meet their health care needs.

This study did not find any articles with keywords “PCOS” or “polycystic ovary syndrome” in Teen Vogue. However, the following comment was posted by an adolescent reader in response to a Teen Vogue article titled “Everything You Always Wanted to Know About Periods (But Were Afraid to Ask)”. The comment depicts an adolescent’s helplessness and feelings of being ignored by both health care providers and caregivers.

> "I'm nearly 16 and I have really irregular periods, like every two months, sometimes more, and I have bad skin. I also have excessive hair on my stomach, upper lip and chin. My leg hair and eyebrows are very dark and thick (which I got told was strange considering I have light hair) and my mum has PCOS. I went to the doctors and they said that it doesn't look like I have PCOS that it's just hormones due to puberty etc, but since then the symptoms have gotten worse. My doctor wasn't very helpful and seemed to push me aside, and my mum doesn't seem to understand how self conscious I am about the hair on my body, is there anybody else I can speak to about this? (UK)". (Kiefer, n.d.)

In this comment, the reader shares her PCOS-related symptoms such as irregular periods, acne, and hirsutism (excessive hair growth). She discloses family medical history by stating that her mother has PCOS. The reader then describes how a health care provider suggested her symptoms were normal or expected changes in pubertal development among adolescents. Her perception that the doctor was not very helpful and pushed her aside appears to develop as a result of the lack of diagnosis and treatment at the initial doctor's visit and after her symptoms worsened. This, combined with her mother's inability to empathize or understand the negative effect hair has on her body image, creates a sense of frustration and isolation that leads her to ask whether there is anyone else she can consult.

Personal experience as a catalyst for advocacy

Personal stories and medical advice articles portrayed women's experiences with PCOS as catalysts for change and advocacy. The following is an excerpt of a YouTube video embedded in a Redbook article titled "'I'm giving infertility a voice.' Video. Carla opens up about her struggle with polycystic ovarian syndrome." Carla begins by telling viewers "I wish I had known that infertility isn't something to be ashamed of." Then she goes on to say her name is Carla, she is 28 years old, and has been diagnosed with polycystic ovarian syndrome and Factor V Lein, a condition that can increase one's risk of developing abnormal blood clots (Mayo Clinic Staff, 2012). Then, Carla reflects on her experience with PCOS-related infertility:

> "Infertility can be really lonely. Besides the shame you might feel, there's a lot of misconception and misinformation floating around. I made it my mission to combat that and give infertility a voice by sharing my journey and educating those around me. I'm really proud of myself that I can look back on my journey to motherhood and know that not only did I become more resilient as an individual, and not only did it strengthen my marriage, but I was able to give hope to other people by educating them about infertility. I wish I hadn't been so ashamed about my diagnosis, but I'm glad I eventually realized, it's not my fault." (Carla, 2010, October 10)

In this video, Carla refers to infertility not only as a biological condition that hinders a woman's ability to get pregnant, but also an obscure, mystifying experience characterized by loneliness and shame. Carla's use of "lonely" suggests she experienced lack of communication, support, empathy, and understanding from others, and felt "shame" about her inability to conceive and fulfill her gender roles as a woman, mother, and wife. The excerpt also suggests that Carla's distressing experiences with infertility propelled her to take on a "mission"; a sense of duty and responsibility; to share her "journey" from infertility to motherhood, knowledge of infertility and treatment, and advocate for women struggling to cope with infertility. Carla expresses pride in her ability to rebound from adversity, get closer to her partner, strengthen her marriage, and give hope to people desiring to have children, by improving their health literacy about infertility. Carla concludes by expressing happiness about realizing she was not to blame for her diagnosis of infertility.

Women's magazines also featured personal stories of celebrities speaking out about their experiences with PCOS. For instance, Health published a piece featuring Whitney Thore, the star of the reality TV show My Big Fat Fabulous Life, that features Thore's efforts to embrace her body (TLC Cable Network, 2015). Whitney gained notoriety when she posted a YouTube video titled "A Fat Girl Dancing" in which she danced to a popular pop song (Thore, 2014). According to Health:

> "Her videos became so popular that the now 30-year-old Thore launched the #NoBodyShameCampaign, a movement that encourages self-love and acceptance no matter your size or gender. Now the Internet sensation is spreading her message on an even bigger platform—reality TV."
>
> "Though she now weighs 380 pounds, Thore wasn't always so heavy. In fact, she

> was a dancer in her youth and at one point weighed 120 pounds, People.com reports. Her struggle with weight gain started during her first year of college, when she put on 100 pounds. Over the next few years, she went on to gain another 100. Later, Thore was diagnosed with polycystic ovary syndrome (PCOS), a hormonal disorder that affects an estimated 5 million women in the United States."
>
> "Even Thore admits her weight gain wasn't due solely to PCOS. "Now I've gained 200 pounds so certainly I take personal responsibility. That's not all because of a medical condition," Thore told The Today Show last year. "But definitely I felt so ashamed once I started gaining weight that I was too embarrassed to even go to a doctor." If you think you've put on too much weight, it's important to take the time to get it checked out." (Swalin, 2015, January 13)

This piece depicts Thore as using her popularity to launch a campaign and drive a movement that promotes love and acceptance of one's body. The article suggests Thore's motivation for "spreading her message" resulted from her experiences with PCOS, body image, and conviction to challenge social norms of what ideal bodies should look like. The piece describes how Thore gained weight over time, partly due to PCOS, and in Thore's words, partly due to "personal responsibility". The use of "personal responsibility" suggests Thore believes personal choices, perhaps lack of self-discipline and control, contributed to her weight gain. The shame and embarrassment she experienced as an obese person created barriers to seeking medical help. Considering her avoidance and delay seeking health care, she advises others to seek medical help if they experience unexplained or rapid weight gain.

Women's magazines also featured personal stories of celebrities that, compared to Thore, were not overweight, obese, or had visible signs of PCOS. This included a piece titled "Jaime King Opens Up: Miscarriage, IVF—and Then Natural Conception" featuring actress and model Jaime King in Parents magazine:

> "The 35-year-old actress speaks openly about the traumatic process in this week's People magazine, revealing that she had five miscarriages, endured five rounds of IVF, and 26 rounds of IUI. She says that a diagnosis of endometriosis and polycystic ovary syndrome were behind her difficulties."

> "So with a healthy and happy 1-year-old baby in her life, and that suffering behind her, why is she talking about her miscarriage experience now? Because she says she wants to open up lines of dialogue about a topic that can be stubbornly closed for suffering hopeful moms-to-be out there. “I was hiding what I was going through for so long, and I hear about so many women going through what I went through,” she told the magazine. “If I’m open about it, hopefully it won’t be so taboo to talk about it.” (Dubin, 2015, January 14)

The piece indicates that King publicly disclosed her diagnosis of PCOS as an underlying cause of her infertility. King's experience trying to conceive is described as "traumatic", suggesting her experiences with miscarriage, and forms of assisted reproductive technology such as in vitro fertilization and intrauterine insemination (Mayo Clinic Staff, 2013; Medline Plus, 2014), were stressful ones that impacted King's physical and emotional health and caused her "suffering". King describes her motivation for publicly sharing her experiences as the want to "open up lines of dialogue" about infertility and facilitate dialogue about a topic she refers to as "taboo", as socially unacceptable or forbidden to discuss publicly. King perceives herself as a popular, influential figure that can promote open discussion about infertility by sharing her private, intimate experiences with infertility with the public.

Women's magazines also depicted collective efforts to raise awareness about PCOS. The following excerpt is about the Armpits4August campaign published in an article titled “Would THIS Convince You to Stop Shaving?” in Women’s Health:

> "One thing you don’t see on the street every day? Women with pit hair (or ones with more than just stubble anyway). But starting today, the sight might become at least a little more common. A new movement called Armpits4August is encouraging women to stop shaving their underarms for 31 days to raise awareness about Polycystic Ovary Syndrome (PCOS), a condition that causes, among other things, excess hair growth."
>
> "**The Movement for Awareness** While treatment options do exist (as mentioned above), it’s mostly on patients to take care of visible signs like excess hair growth. But is it something they should have to take care of? Not according to the U.K.-based Armpits4August."

> "People who are signing up to take part in the campaign are swearing off shaving for the entire month of August, and in exchange, they get to attend events like a "Pit Pride Party" and a "PitMob" in London. But more importantly, participants will also raise funds for Verity, an organization that educates healthcare professionals on PCOS and gives women who have it a support system."
>
> "Ready for the buzzkill? Armpits4August events haven't been organized in the U.S.—yet. But you can still check out Armpits4August.org to sponsor a participant or donate to the charity directly. And if you're brave enough to also stop shaving this month as a show of solidarity, more power to you!" (Moriarty, 2013, August 1)

The piece suggests that armpit hair is rarely seen in public because women shave or hide armpit hair to conform to social expectations of hairless women as beautiful and feminine. Armpits4August encourages women to interrupt the practice of hair removal, make their armpit hair visible and public, and use their hair to attract attention to excess hair growth, an iconic symptom of PCOS known as hirsutism (American Society for Reproductive Medicine, 2012). The article questions whether women should be responsible for concealing excess hair growth. One of Verity's aims, to give women with PCOS a "support system", suggests that there is limited or inadequate social support for women with PCOS, and that building a system or network of people that contribute to women's health and well-being is important. Use of the slang word "buzzkill" suggests that learning that Armpits4August has not been organized in the U.S. will be disappointing for readers living in the U.S. Nevertheless, the piece encourages readers to be part of the movement remotely and "show solidarity", an act of unity with women with PCOS, by not shaving armpit hair, an act the article describes as requiring bravery to challenge dominant social norms about hair.

Personal responsibility for one's health

Women's magazines published articles containing information about PCOS symptoms, diagnosis, and treatment. Some articles also cited medical experts who provided women with

recommendations to manage their health, such as this one published in Self titled "Could you have PCOS?":

> "If your periods are infrequent or nearly absent, alone or with other symptoms such as acne, excessive hair growth or weight problems, see your doctor, advises Walter Futterweit, M.D., of the Mount Sinai School of Medicine in New York City. "As many as 80 percent of women with irregular cycles have PCOS," he says. The key is to see a health care provider with knowledge of the condition (ask whether the doctor frequently sees patients with PCOS). You can also request a referral to an endocrinologist. And if you do have PCOS, remember: The condition can be controlled, but it takes discipline. For support, visit PCOSupport.org (http://PCOSupport.org). To get up to speed on the latest research, check out the American Association of Clinical Endocrinologists' PCOS position paper (/pdfs/PCOSpositionstatement.pdf)". (SELF, 2007, January 23)

This piece primarily places responsibility on women, or patients, to seek high-quality health care, manage their health, find social support, and learn about research on PCOS. The phrase "see your doctor" assumes readers have a regular health care provider and ignores barriers to health care access, including the possibility that some women may not have a provider they can refer to as "their doctor". Additionally, the piece places responsibility on women to find a knowledgeable and experienced health care provider. The piece tells women to ask whether the doctor frequently sees patients with PCOS, overlooking the possibility that women like Alexa Stevenson, may be timid or hesitant to ask questions or question the provider's knowledge and experience for fear of appearing disrespectful, let alone request a referral to a specialist. Furthermore, the piece reminds women that PCOS can be controlled with "discipline", suggesting that self-control is a primary factor in managing physical activity, diet, and medication use. This reminder overlooks women's barriers to PCOS management such as health literacy and financial resources that one cannot overcome solely with discipline. While the link to PCOSupport may aid readers in their search for online social support communities, the extent to which readers will understand the American Association of Clinical Endocrinologists' PCOS

position paper is questionable. At the time the magazine article was retrieved, the link to the PCOS position paper led to a notice that the page could not be found. However, the position paper referenced in the article was available on the American Association of Clinical Endocrinologists website. Although the paper indicated the purpose of the statement was to "…inform health care professionals and the public about the need to identify women with PCOS…." (American Association of Clinical Endocrinologists, 2015, p. 126), the general public may not be able to fully understand the technical, medical terminology in the paper.

To a lesser extent, women's magazines published pieces that placed responsibility on health care providers to diagnose PCOS. For instance, the following piece was published in O, The Oprah Magazine entitled "5 Questions to Ask at Your Next Doctor's Appointment". The caption read, "An ophthalmologist spotting high cholesterol? A dentist diagnosing diabetes? You might be surprised by what specialists can discover before your GP does."

> "The Dermatologist"
>
> "Ask: 'Could I have PCOS?'"
>
> "Polycystic ovary syndrome (PCOS), a hormonal imbalance associated with infertility, is characterized by irregular periods, ovarian cysts, and higher levels of hormones called androgens. 'Many symptoms of excess androgen are manifested on the skin—like acne along the jawline and dark hair on the face and chest,' says Rachel Reynolds, MD, assistant professor of dermatology at Harvard Medical School. In fact, up to 92 percent of PCOS sufferers have excess hair growth, while up to 35 percent experience breakouts. 'Dermatologists are trained to pick up on certain skin patterns, so we're able to connect the dots others may miss,' says Reynolds." (Haak, 2013, June 25)

In addition to advising women to ask a dermatologist whether they could have PCOS, the cited expert in this piece points out how dermatologists' training can "connect the dots others may miss." This suggests that dermatologists play an important role in diagnosing PCOS, particularly in cases PCOS symptoms such as acne and hirsutism have

been overlooked by other health care providers.

Self-efficacy and Control

Women's magazines featured personal stories illustrating how women used self-efficacy to manage PCOS and take control of their health. The following piece titled, "12 Crazy-Inspiring Photos and Details of Weight Loss Success Stories" appeared in Women's Health:

> "The Lifestyle: Courtney dove into daily workouts. She jumped rope, punched bags, and learned how to fight. She fueled up with veggies and lean protein, and gave up ice cream after learning to satisfy her sweet tooth with fruits like pineapple. Courtney knew she was on the right track when her scale showed a 10-pound dip in the first month of her new routine. By her first boxing tournament in February 2010, she had dropped 30 more pounds. When Courtney finally hit 130 pounds that May, she needed a new wardrobe. "I'd thrown out all of my skinny clothes," she says.
>
> The Reward: Her closet isn't the only thing that was overhauled: Boxing also gave Courtney a major self-esteem boost. "I used to be afraid of talking in front of people," she says, "but now I'm confident." And although her PCOS is permanent, she feels healthy and has tons of energy. "I know I can face anything," she says. "Just like in the ring, you can always go one more round. You just have to dig for it." (Women's Health, 2012, October 22)

Courtney's boxing serves as a metaphor for her "fight" against PCOS, a chronic condition that although permanent, Courtney is confident she can "face" or manage each "round". Courtney's hard work and dedication toward a healthy lifestyle was in a sense like training for a boxing tournament in which she learned to fight an opponent. In this case, poor diet and inactivity were the opponents or barriers to weight loss. As a result of Courtney's determination, she not only improved her health, but also built self-esteem and confidence. "You just have to dig for it" suggests Courtney views one's ability to change as a matter of personal responsibility such as lifestyle choices and hard work.

Some women's magazines provided space at the bottom of the page for readers to respond to an article's content. In the following quote, a reader responds to Glamour's article on

endometriosis and PCOS:

> I was relieved when I read this article. A week before I picked up my Glamour Magazine my dermatologist told me to that my acne may be cause by an imbalance in my hormones, this may be a sign of PCOS. She asked me if I had been having regular periods. And for as long as I can remember I never had. But other doctors told me, just like how the article said, "It is probably stress" or any series of other things. I was always very active with sports, so they found this as another reason for my inconsistent periods. So reading your article made me realize I really should get this check out. I did the little check list you guys gave and I had experienced all the symptoms but one. I made the appointment. Had the ultrasound done. Got the results back. I am glad I caught it so young. I am 19. I am in no way looking to have children now. But I am hoping finding that I have PCOS out so early will help me with having kids of my own in the future. I am now much more informed for having read this article. THANK YOU! (Sklar, n.d.)

The reader shares her experiences with heath care providers and use of health services. Interestingly, the reader's visit to a dermatologist, a specialist rather than a general provider, resulted in her first possible diagnosis of PCOS. The conflicting information she received from other providers created uncertainty about her diagnosis, an uncertainty that lessened after the magazine check list results suggested PCOS. The reader's comment illustrates several steps she took to seek medical care, access health care services, and prevent PCOS-related infertility in the future. Doing the check list, for instance, illustrates how the reader actively sought information to learn more about PCOS symptoms. She then made an appointment, attended the appointment, and had an ultrasound. An ultrasound is one of several exams a health care provider can order to better understand the appearance of women's ovaries and thickness of the uterine lining, information the provider can use to diagnose PCOS (Mayo Clinic Staff, 2014). "I am glad I caught it so young" suggests the reader was aware of her risk of infertility in later life due to PCOS and was happy to have an opportunity to prevent infertility.

The reader's comment also provides insight into the reader's engagement with the

article's content. For instance, the comment indicates the content affected the reader's emotions; the reader felt "relieved" as a result of reading an article on a topic she identified with. The article's check list was a self-assessment tool that further engaged the reader with the content and helped her be "much more informed" about PCOS in relation to her health. "So reading your article made me realize I really should get this check out." suggests the content influenced the reader's perceptions of her health and decision to seek medical care. Finally, the capitalized "THANK YOU!" expresses the reader's sentiment, a great amount of gratitude, regarding the publication.

Women's Social Roles and Responsibilities

Women's magazines published articles that depicted PCOS as hindering women's roles and responsibilities as wives and mothers. PCOS symptoms affected women's relationships with their husbands, the production of breast milk, and prevented or delayed childbearing.

Essence published a piece in a segment titled Steve Harvey Morning Show's Daily Strawberry Letter. The Steve Harvey Morning Show is a morning radio show hosted by Steve Harvey and co-hosted by Shirley Strawberry. The Strawberry Letter is a part of the show in which listeners submit letters online describing personal issues and problems, in hopes that Steve and Shirley will provide them with advice on how to deal with these on air during the radio show. The following letter was submitted by a listener:

"Today's topic: Less Than A Wife"

> "Hello Steve, Shirley, and Morning Crew. I am a 39 yr old woman with a wonderful husband. He is a God fearing man, that is an excellent provider, and the best husband that any woman could ask for. He is the most unselfish person that I have ever met. We desperately want to start a family but this past summer I was diagnosed with diabetes and ended up in ICU with a blood sugar of 980. The nurse said that I should have been in a coma. Well because of this the doctor told us that we really should try to wait a while before we try to conceive. I also have PCOS (Polysystic Ovary Snydrome) which is already an issue and now this. I feel

> like less than a wife because I can not give my husband the one thing that he wants the most. He is very supportive and never pressures me about this but, I really want to start a family with my husband. I feel terrible about this situation." (Essence, 2010, January 18)

The writer holds her husband in high regard, describing qualities that characterize him as "wonderful". Her description of him as "an excellent provider" and as "the best husband that any woman could ask for" suggests she perceives him as meeting his role and responsibilities as a husband. The writer's tone becomes somber as she blames her poor health as preventing or delaying pregnancy and PCOS as an additional barrier or burden to starting the family she and her husband "desperately want". The letter suggests the writer perceives childbearing as a wife's responsibility, and her inability to give her husband a child, "the one thing that he wants the most", leading to the perception that she is "less than a wife".

The following excerpt published in Fitness featured Olivia Ward, season 11 winner of The Biggest Loser, a reality weight-loss television show. The piece was titled "Biggest Loser's Olivia Ward's Tips for a Fit Marriage" and the caption read "Losing 242 pounds has made Ben and Olivia's marriage stronger—and spicier—than ever. Here are secrets from The Biggest Loser's marriage makeover."

> "And now their astounding weight loss — 242 pounds combined — has brought huge gains to their relationship. "Everything is revitalized and new," Olivia says. Including their sex life: "It's refreshing, to be quite candid, to not have to think about, Oh, man, I'm just jiggling all around here!" she admits. "I feel confident in my skin. And I feel like I have something better to offer to him."
>
> "Olivia, who suffers from polycystic ovary syndrome, a condition that causes ovarian cysts and often disrupts the menstrual cycle, went on the show because doctors told her she needed to lose weight if she hoped to improve her chances of getting pregnant. She's now looking forward to starting a family with Ben. But first they're planning a bike trip through Italy and focusing on enjoying the new spark in their relationship. As Olivia puts it, "How often in your life do you get to completely spice up your marriage?"

(Haney, 2011, October)

The excerpt suggests that Olivia's weight loss strengthened her marriage by allowing her to do things with her husband that she could not have done as an obese wife. Although Olivia's initial reason for losing weight may have been to manage PCOS and increase her changes of becoming a mother, becoming a better wife took precedence after her weight loss. The article implies that as a result of weight loss, Olivia gained confidence in her physical appearance; and in turn, became less restricted or inhibited in her sexual relationship. "I feel like I have something better to offer to him" suggests that the weight loss experience allowed Olivia to be more responsive to her husband's needs, sexual or other needs. Weight loss also led to her ability to engage in physical activities with her husband such as long distance cycling.

The following piece was published in Parents in a question and answer section called "Ask Our Experts" described as "Got Questions? We've got answers from experts and parents who've been there." in which readers send the magazine questions they would like answered by featured experts. A reader asked the following question, "Is breastfeeding when overweight difficult?" The response was as follows:

> "You most likely have nothing to worry about. Simply having a larger body type and bigger breasts should not inhibit your body's ability to produce milk or your baby's ability to latch on to your breast. You may have to experiment with different nursing positions that work better than traditional holds (trust me, getting a comfortable hold and latch can be tricky for any new mom), but this is an easy hurdle to overcome. Most plus-size women can breastfeed just as well as other women.
>
> However, if you're overweight because of a hormone or endocrine problem, like polycystic ovary syndrome (PCOS) or thyroid disease, you may have issues with your milk supply, since these conditions can also affect production of the hormones that trigger your body to make milk. But having PCOS, thyroid disease, or other hormone-related illnesses doesn't necessarily mean you won't be able to breastfeed. You may just have to supplement more often with formula to keep your baby fully nourished. If you're worried, it's a good idea to talk to a lactation

> consultant to help you and your baby get the hang of nursing if you run into problems." (Meredith Corporation, 2009)

The reader's question suggests she is concerned that her body could hinder breastfeeding, preventing her from meeting her responsibilities as a mother. While the first part of this piece depicts the process of trying out different nursing positions as natural, as something new mothers just have to experiment with, regardless of whether women are overweight, the piece goes on to depict PCOS as a potential barrier to nursing. For instance, the piece suggests that limited milk supply associated with PCOS can limit women's abilities to fully nourish their babies, a hurdle not as easy to overcome as finding the best nursing position. Additionally, PCOS is portrayed as a condition affecting both mother and child; that is, PCOS affects mother's milk supply due to overweight and affects the child's feeding through the mother's milk supply. Anticipating that readers would be "worried" after their milk supply, the piece advises women to talk to a lactation consultant.

The following piece titled "Want a Baby One Day, How To Preserve Your Fertility" appeared in Women's Health:

> "See your doctor. If you want to keep your body baby-ready, staying in top physical shape is essential. That means getting any fertility-sapping health issues—like diabetes, polycystic ovary syndrome (PCOS), or endometriosis —under control; diagnosing and treating STDs; and devising a healthy diet and exercise plan. If you're past 35 and wondering whether you have the option of waiting a few more years, you can also ask your doc to do a little detective work on what's known as your ovarian reserve." (Cohen, 2009, August 16)

The piece assumes that women want and expect to have a baby one day and become mothers. The piece portrays PCOS as a "fertility-sapping" health issue, as a threat to women's childbearing potential. PCOS, in addition to other health issues, age, and poor diet and exercise

create barriers to childbearing and women's opportunities to experience motherhood

While the piece above speaks to women looking to be first-time mothers, the following piece published in Parenting titled Ready for Another Child speaks to women who have had children and wonder if they are ready for another child:

> "If your first pregnancy was complicated—say you had a postpartum hemorrhage or blood pressure problems—wait until those issues are resolved before trying again. On the other hand, advancing age or medical conditions (such as endometriosis or polycystic ovary syndrome) may prompt you to get rolling sooner." (Patz, n.d.)

The piece suggests that the timing of childbearing among older women and those with medical conditions such as PCOS is restricted. Use of "get rolling sooner" advises women not to delay childbearing if they wish to continue building a family. Family planning appears to be particularly important for women with PCOS.

Beauty and Femininity

Articles published in women's magazines tended to associate visible symptoms of PCOS such as thinning hair and hair loss, excessive hair growth, acne, and weight gain with embarrassment, shame, and poor body image. These symptoms were portrayed as undesirable and as having a negative impact on beauty and femininity.

The following excerpt is from an article titled "Best Treatments And Styles for Thinning Hair" was published in the Beauty section in Prevention magazine. The article's caption read "Easy, effective advice and style ideas for fuller, thicker looking hair".

> "Roxy Finn*, 47, first noticed her hair body was thinning in her 20s, but it's gotten worse in the past few years. "It's one of the most devastating things I've ever had to face," she says. "Women are supposed to have thick, sexy hair, so it's a big chunk of your sexiness down the drain—literally!" Initially, Finn thought the thinning might have been due to perming her hair, but after consulting her primary care doctor, gynecologist, and dermatologist, she learned that the real problem is a genetic predisposition to hair loss in women. Put simply, her hair is no longer growing in as thick or as long as it did when she was younger."

"**Name has been changed*"

> "Although this type of hair loss doesn't necessarily indicate a medical issue, you should consult your GP to rule out a thyroid problem, iron deficiency anemia, or an excessive level of male hormones (common when you have polycystic ovarian syndrome or when estrogen levels drop off around menopause); these conditions may cause a different type of hair loss or aggravate FPHL if left untreated." (Sole-Smith, 2011, November 3)

The piece begins with Finn's personal story of hair thinning and hair loss, an experience Finn described as "devastating", indicating the experience had a negative impact on her life. Finn's expression that "women are supposed to have thick, sexy hair" suggests Finn associates women's thick head hair with femininity and sexiness. "So it's a big chunk of your sexiness down the drain—literally!" suggests that hair thinning and hair loss represent a loss of femininity and sexiness. Later, the piece describes PCOS as one of the conditions that can cause hair loss or aggravate female pattern hair loss (FPHL) if left untreated. Although Finn's hair loss was not due to PCOS, mention of PCOS as a condition characterized by an "excessive level of male hormones" depicts PCOS as a threat to women's femininity.

Compared to the previous excerpt depicting thinning hair and hair loss as unfeminine, the following piece depicts excessive hair, particularly facial hair, as unfeminine. This piece was published in Family Circle published in a section titled "Your Embarrassing Health Questions Answered", with a caption that read "We have the answers to those cringe-worthy health questions you can't bear to discuss with your doctor."

> "Where did this mustache come from all of a sudden?"
> "I jokingly call it a 'birthday gift,'" says Nia Terezakis, M.D., a dermatologist in private practice in New Orleans. "As we get older, estrogen drops, leading to higher androgen levels, and we may develop more facial hair." It runs in families, so a mom or aunts who are hairy mean you may be too."
>
> - **"Doctor Yourself**: Plucking, waxing, bleaching and depilatory creams are inexpensive solutions. Even shaving is fine—it's a myth that the hair grows back thicker. The diameter of the hair that comes through the skin

surface just appears thicker because it's not tapered."

- "**Call Your M.D.**: Laser hair removal and electrolysis are long-term fixes, lasting for years. But they're expensive and require multiple visits, says Dr. Terezakis. A less pricey option is Vaniqa, a prescription cream that slows hair growth. But tell your doctor about any other symptoms (hair on your chest, acne, irregular periods), which may be signs of a hormonal imbalance called polycystic ovary syndrome (PCOS)." (SanSone, 2013, July)

The reference to women's facial hair as a "mustache" challenges social perceptions of women as hairless and smooth and conforms to perceptions that facial hair, particularly mustaches, belong to men. As the article title suggests, facial hair causes women embarrassment, and the piece advises women to conceal and remove facial hair using a variety of products and practices like shaving and bleaching to prevent embarrassment. While the piece primarily focuses on hair removal for cosmetic reasons, it also educates readers about potential hereditary or genetic factors and conditions such as PCOS underlying excessive hair. Although mention of PCOS is brief, the one sentence alerts readers that hair on other parts of the body, combined with acne and irregular periods, can be "signs" of a health problem or issue warranting medical attention. Paradoxically, the piece initially advised women to keep hair growth private and hidden from public view, then the piece encourages women to be open and public with health care providers about hair on their chest and concurring symptoms, as these could affect women's health and be signs of something more than solely an embarrassing cosmetic problem.

To a lesser extent, women's magazines published articles that countered dominant perceptions of beauty. For instance, the following excerpt published in Parenting titled "Real Postpartum Mom Bodies, Real Beauty", depicts one woman's emotions and perceptions toward the bodies of pregnant and postpartum women:

> "Pregnancy and childbirth spark a wide range of feelings for most of us about ourselves and our bodies—everything from appreciation and celebration to horror

> and self-loathing, and all that lies in between. And, for all that we see of celebs' teeny-weeny postpartum bikini bodies, we rarely catch an up-close-and-personal glimpse of real moms' bodies after a babe has wreaked its havoc (except for the tremendously awesome site The Shape of a Mother, filled with unflinching, beautiful photos of pregnant and postpartum bodies—note, it's not appropriate viewing for work). I mean, how many of us are proudly sporting our pregnancy "tiger stripes" (stretch marks) as the badges of honor they are?"
>
> "And so, with the same appreciation I feel toward women who nurse in public, showing everyone just how normal, natural—and beautiful— breastfeeding is, I was near (happy) tears when I stumbled across artist Erin Darcy's gorgeous photos the other day on her blog, Starving Artist Ink. In an entry called, "the shape of a mother," Erin, a native of Oklahoma living in Ireland who had earlier blogged about her struggle with PCOS-related infertility, posted a handful of photos her husband had taken of her a several weeks after the birth of their daughter, accompanied only by the strong, sweet message, "you are beautiful, do you know that? and your imperfections make you even more perfect." (Melanie, n.d.)

The writer's description of Darcy's photos as "gorgeous" suggest the writer views Darcy's postpartum body, one that is overweight and sporting "tiger stripes", as beautiful. Darcy has a "real mom's" body, a body whose shape and size changes due to pregnancy and takes on the "shape of a mother". The writer's happiness upon seeing Darcy's photos suggests the writer appreciated Darcy's decision to make her imperfect, blemished body, public and visible; and in doing so, challenges social perceptions that women's postpartum bodies are unattractive. Darcy's struggle with PCOS-related infertility further characterizes Darcy as a strong woman that challenged and overcame infertility to become a mother.

Discussion

The presence of PCOS content in digital magazines in this study counters previous findings that women's magazines tend to feature health content that is "old news", information the public is generally familiar with and readers are likely to have been exposed to the information from other sources (Barnett, 2006, p. 5). PCOS is far from being "old news" to health care providers, patients, and the general public. In fact, PCOS is a topic that within the last three years medical experts have referred to as a "hot topic" and "new frontier" in the area of female fertility (Cecconi, 2012, p. 231).

The results are consistent with research suggesting that women with menstrual problems, including heavy and irregular bleeding, struggle to prove the legitimacy of their symptoms and their severity to health care providers (Julian, Rashid, Baker, Szczepura, & Habiba, 2010). The magazine articles included in this study, for instance, portrayed women, and an adolescent, as visiting health care providers several times before their symptoms were validated as a problem, and the time spent searching for answers to symptoms was seen as a hindrance to diagnosis and treatment. Indeed, an online survey of over 1,500 women with PCOS found that it took about three months for women to receive a diagnosis of PCOS, and about 30% of women visited four or more doctors before obtaining a diagnosis (Sterling, Vincent, DeZarn, & Perloe, 2010). This phenomena of women struggling to prove to health care providers that their symptoms are real is not new, however. During the women's health movement in the 1980s, for instance, women struggled to prove that they experienced negative side effects as a result of taking Depo Provera, an injectable birth control method, that at the time had not been approved by the Food and Drug Administration for contraceptive use and whose potential side effects had not been fully tested. Women reported approaching physicians with their symptoms only to be told that it "was all in

their head", a type of "it must be in your head syndrome" physicians diagnosed women with (Kline, 2010, p. 114). Such experiences led women to question whether in fact their symptoms were only in their mind. Similarly, more recent research has observed that as a result of their inability to "prove their case" to health care providers, women with menstrual problems begin doubting whether their menstrual problems are indeed severe enough to continue seeking medical attention (Julian et al., 2010, p. 208). Consistent with representations of health and illness in popular media (Kline, 2011), this study's findings also suggest that women's magazine articles depict women's reliance on medical authority, that in some cases, can have negative health consequences if symptoms are left undiagnosed and untreated.

Discourse regarding PCOS symptoms in magazine articles also reflected ideologies of beauty and femininity and depicted women doing beauty work. Beauty work refers to the practices women engage in to alter their bodies and appearance to be perceived as physically attractive, improve self-esteem, and elicit positive interactions and perceptions from others (Kwan & Trautner, 2009). For instance, articles included in this study grabbed readers' attention with hooks that depicted women's sexiness going down the drain and the embarrassing mustache. Although readers were advised to seek medical help if they experienced PCOS symptoms, advice was embedded in depictions of women engaging in practices like shaving, waxing, and preventing loss and thinning of head hair to achieve beauty and femininity. The findings that women's magazine articles depicted PCOS symptoms as challenging women's perceptions of beauty and femininity are consistent with previous research suggesting that PCOS symptoms such as body hair and absent or irregular periods lead women to feel "not as womanly" as other women (Snyder, 2006, p. 388).

Interestingly, the present study suggests that articles in women's magazines also attempt to challenge dominant discourse of beauty and femininity, albeit within the confines of gender norms. As Fisanick (2009) wrote,

> "The PCOS body has great potential to transgress the boundaries of normative femininity. In all of its hairy, balding fatness, the PCOS body represents a challenge to what is expected of the female body. The problem is that it lacks visibility. It is hidden within the matrix of cultural expectations, and attempts to make the PCOS body visible are regulated not only by society but by women with PCOS as well." (Fisanick, 2009, p. 109).

While women's magazines did not tend to publish photographs of actual women with PCOS, their articles are making the PCOS body visible by publishing content on PCOS and women's experiences with symptoms like hair loss, excessive body hair, obesity, menstrual problems, and impaired fertility. Articles featuring celebrities' experiences with PCOS-related obesity and infertility counter arguments that women's magazines publish "Pollyanna pieces" about celebrities that avoid topics "where the celebrity opens their closet of skeletons and bleeds out their most personal private struggles on the page" (Nelson, 2012, p.233). The pieces featuring Thore and King included in this study, for instance, opened up the "closet of skeletons" and revealed Thore's struggles with weight gain, obesity, shame, and embarrassment. Interestingly, rather than give in to social pressures to be thin, Thore chose to challenge beauty ideals and pursue self-love and acceptance as an obese woman. King's personal, private, and traumatic experiences with infertility and miscarriage--five miscarriages, five rounds of in vitro fertilization, and twenty six rounds of intrauterine insemination--were "bled out on the page". This piece depicted King's suffering through infertility treatment to achieve her social role as a mother. Additionally, the piece depicting pregnant and postpartum bodies as beautiful directly challenged notions of ideal bodies. In fact, that article was one of the few that included a photograph of an actual woman with PCOS. Darcy's body--nude, postpartum, overweight,

flabby, stretch marks and all, was praised as a realistic representation of physical beauty. However, as a White woman, Darcy's body represents dominant beauty ideals of the fair skinned woman as beautiful.

In fact, the absence of discourse on race and ethnicity in magazine articles included in this study, and the absence of PCOS content in magazines directed toward Latinas and African American women, suggests that portrayals of women with PCOS largely focus on the White body. This is concerning as Latina and African American women are particularly at risk of PCOS due to high rates of obesity and metabolic problems (e.g., insulin resistance, hypertension) (Fauser et al., 2012) among these groups, and screening rates for metabolic problems among racial and ethnic minority women with PCOS tend to be low (Mott, Kitos, & Coviello, 2014). In the current study, O' The Oprah Magazine, a magazine whose media kit claims to reach more African Americans readers than Glamour, Redbook, Self, and MORE (O' The Oprah Magazine, 2014b, Spring), did not publish any articles depicting stories of African American women with PCOS. Furthermore, neither Cosmopolitan en Español or Vanidades, magazines published in Spanish and directed toward Latinas, published content that depicted stories of Latinas or Spanish-speaking women with PCOS. Cosmopolitan en Español published two articles entitled "7 reasons why your periods might be late without you being pregnant" and "12 signs your skin reveals about the health of your body". Vanidades published one article entitled "How to treat acne in adulthood". PCOS was not focal in these articles, rather it was depicted as one of several symptoms or causes of health problems among women in general. In fact, one of Cosmopolitan en Español's articles was practically identical to one published by Women's Health entitled "7 Reasons Your Period May Be Late. Other Than Pregnancy". This suggests that the content was generalizable to female readers, regardless of race or ethnicity. Other research also suggests

such generalizability may also be present in magazines directed toward Latina women. For instance, a content analysis of Cosmopolitan en Español, Latina, and Siempre Mujer, magazines directed toward Latinas, found that while these magazines depicted both thin, Caucasian women and curvy multiracial women as beautiful. However, depictions of Latinas' bodies tended to be homogenous, as hourglass and pear shaped (Torres, 2013). Such depictions can overlook the PCOS body that is likely apple shaped due to abdominal adiposity (Moran, Norman, & Teede, 2015).

The lack of discourse on race and ethnicity in women's magazines might also mask the influence of race, ethnicity, and culture on women's PCOS-related health. For instance, research with African American women with breast cancer suggests that religiosity plays an important role in women's timing to seek medical care. Specifically, women who talked to God only, about a breast symptom, delayed seeking medical care, compared to women who disclosed their symptoms to others (Gullatte, Brawley, Kinney, Powe, & Mooney, 2010). Additionally, a study of twenty one issues published in four mass circulating print women's magazines from January 2004 through June 2004 found that Essence published the most health stories with words associated with spirituality and religion such as "God", "Higher Power", and "church, compared to Ms., Good Housekeeping, and Redbook (Lumpkins, Cameron, & Frisby, 2012, p. 84). These stories featured content on health care, HIV/AIDS, exercise, reproductive and sexual health, mental health, and food and diet (Lumpkins et al., 2012). However, it is unknown whether the inclusion of spirituality and religion was a strategic attempt by editors to publish culturally relevant health information for its readership. Interestingly, the present study surfaced only one piece associated with content on religion and spirituality. This was a comment submitted by a reader to Essence's Strawberry Letter titled "Less than a Wife" in which the reader described her

husband as “a God fearing man” (Essence, 2010, January 18). Use of the word “God” suggests that religion or spirituality may be perceived as an important attribute of a person’s character. However, it is unclear how religion or spirituality may be associated with the reader’s PCOS-related health.

This study also found that women’s magazine articles depicted PCOS as hindering or interrupting women’s social roles and responsibilities as wives, mothers, and caregivers of children and family. Ideologies of women as wives and caregivers reflect the gender stereotyping typically seen in health representations in popular media (Kline, 2011). Messages about marriage and caregiving may have been strategically directed to meet readers’ needs and interests. For instance, according to the demographic information collected in the media kits, magazines in this study appear to be interested in women’s ages, marital status, and whether they are parents and have children. Absent from the articles in this study was discourse on how women’s multiple roles and demands may adversely affect women’s health. For instance, research suggests that stress, particularly chronic stress associated with caregiving, marital stress and poor social support from partners, coupled with burdens associated with multiple roles as caregivers and wives, can increase women’s risk for some forms of cardiovascular disease (Terrill, Garofalo, Soliday, & Craft, 2012).

Experiences of adolescents with PCOS were absent from the articles included in this study. Interestingly, it was the comment submitted by an adolescent in the comments section of Teen Vogue, not the article, which directed attention to PCOS as a condition that affects menstruation among adolescents. Posting comments online is a form of user participation in that comments sections allows readers to respond to and participate in the discussion of online content (Weber, 2014). In fact, Teen Vogue invited user comments with the following, “Did we

miss something? Leave your questions below, and we'll do our best to find the answers for you! Remember: If you're wondering, someone else probably is too." (Kiefer, n.d.). The lack of content on PCOS in Teen Vogue may be partly due to the magazine's primary focus on clothing, shopping, and cosmetics (Massoni, 2010). The comment posted by a nineteen year-old in response to an article published in Glamour also suggests that young women read digital magazines that tend to be read by audiences with median age of about thirty six years (Glamour, 2014, August). It is unclear how adolescents perceive and respond to this content, however. A potential risk associated with adolescents' exposure to PCOS content in women's magazines may be worry or anxiety from reading about infertility. Indeed, concerns about PCOS-related infertility tend to begin in adolescence (Dowdy, 2012).

Women's magazine articles tended to place considerable demands on women to take responsibility for their own health. For instance, Thore's admission that her weight gain was due to "personal responsibility", Courtney's advice that "You just have to dig for it", and Self's piece that PCOS can be controlled with "discipline" portray individual behavior as the greatest predictor of one's health. Such discourse of personal responsibility has also been observed in other research with women's magazines. For instance, a content analysis of over four hundred editorials with content on diet, overweight, and obesity published between 1984 and 2004 in mainstream and African American women's magazines found that these editorials primarily provided readers with strategies to change individual behavior such as reducing fast food intake and eating smaller portions, and to a lesser extent, addressed environmental factors that influence health such as neighborhood safety and access to fresh fruits and vegetables (Campo & Mastin, 2007). Similarly, a review of reader's letters to women's health magazines found that writers tended to attribute their successes and failures in managing their health to individual behavior

(Newman, 2007). Discourse on personal responsibility, also referred to as individualizing, has also been observed in popular, mass media representations of health and illness (Kline, 2011).

The present study suggests that discourse on economic and environmental barriers to health is still largely absent from teen and women's magazines. These barriers include high levels of food toxins and environmental exposure to industrial products (e.g., BPA in plastics) that appear to play a role in the development of PCOS (Diamanti-Kandarakis, 2013) and lack of insurance coverage for infertility-based treatments and assisted reproductive technologies, both prior to and after the implementation of the Affordable Care Act (Brezina, Shah, Myers, Huang, & DeCherney, 2013). Personal responsibility discourse that characterizes individuals as weak and blames individuals for poor lifestyle choices and poor health (Brownell et al., 2010) can perpetuate stigma and discrimination toward obese individuals, and hinder efforts that address environmental and structural barriers to health (e.g., improving healthy food access) (Puhl & Heuer, 2010).

Depictions of women's self-efficacy and control in managing their health and health care are consistent with characteristics of the "empowered patient" described in the literature. Empowerment is conceptualized as a process and outcome (Anderson & Funnell, 2010; Holmström & Röing, 2010). Empowerment is a process in which individuals think critically, act autonomously (Anderson & Funnell, 2010), reflect on the benefits of behavior change, are motivated to change their behavior, and develop an enhanced understanding of oneself (Holmström & Röing, 2010). Such process is thought to result in positive outcomes including one's capacity to make informed decisions (Anderson & Funnell, 2010), increased coping with illness; positive self-concept; recognition of personal power, strength, and ability; increased self-efficacy; management of one's health; sense of hope and direction, and improved health

(Holmström & Röing, 2010). Women's magazines published pieces that illustrated women engaged in their health care by seeking treatment, attending appointments, adhering to tests and procedures like ultrasounds, and following up with test results. Women were also portrayed as committed to their health and treatment by diligently adhering to regular exercise, controlling diet, and undergoing infertility treatment. As a result, women were able to manage their PCOS symptoms, conceive, build self-esteem and confidence, feel healthy and energetic; and in one adolescent's case, make a conscious decision to prevent future infertility. Self's piece advising women to find knowledgeable and experienced health care providers and ask whether the doctor sees patients with PCOS can also be interpreted as characteristic of patient empowerment. For instance, Johnson's (2011) conceptualization of health care empowerment depicts empowered patients as ones that practice assertive communication, gauge the credibility and expertise of health care providers, and know when to trust or challenge providers and seek other consultation (Johnson, 2011).

Magazine articles depicted women as change agents that used their personal experience with PCOS as a catalyst for advocacy. These women attached their names, voices, faces, bodies, emotions, and personalities to PCOS by making their most personal, private experiences with PCOS and PCOS-related infertility, obesity, and body image public. In doing so, women directed attention to women's lived experiences with PCOS and their health and social needs. For instance, articles depicted how women "gave infertility a voice", "opened up lines of dialogue", created movements to promote love and acceptance of one's body, and supported campaigns to raise awareness of PCOS with the aim to improve women's lives. It appears that women's advocacy efforts were fueled in part by women's meaning making of their own stressful, shameful, and traumatic life events related to PCOS. Faced with PCOS diagnoses,

miscarriages, and stigma associated with obesity, infertility, and excessive body hair, women engaged in meaning making. Meaning making is a process in which individuals try to make sense of or comprehend a stressful event and search for the value or significance of the event in their lives. Meaning making can result in acceptance of the event, personal growth, enhanced coping skills, a greater appreciation for life, and a change in identity (Park, 2010). In their journey to manage their health and conceive, women gained power and control over their health and their lives, and realized that the knowledge and experience they gained during their journey was valuable and should be shared with others to educate them about complex issues like infertility, facilitate dialogue about "taboo" topics, give others hope, and create solidarity and social support with women who may relate to their experiences.

This study had some limitations related to its cross-sectional design. For instance, articles on PCOS were included in the study if they were available online during the one month search period. However, this does not necessarily mean that the articles were published during that time. In fact, some of the articles included in this study were published before the search period, and in some cases, years before the search period. However, the current study did not examine potential changes in PCOS content over time. Nevertheless, the current study suggests that while digital magazines may publish new content regularly, some magazines also maintain previously published content on their websites for months and even years. How editors or web-managers decided which content to keep online is unclear.

A second limitation has to do with the method used to search for articles using keywords "PCOS" and "polycystic ovary syndrome". This method may not have yielded all the articles containing the keywords. For instance, an article entitled "7 Celebrities Who Manage Life With Chronic Pain" published November 2011 in Prevention magazine containing the keywords was

not returned by the magazine using this search method. As a result, this article was not included in this analysis. This suggests that search bars in digital magazines may not have been sensitive enough to find all articles containing the keywords.

In another instance, Seventeen, a magazine directed toward young women**,** published a piece describing PCOS symptoms, yet the piece did not contain the keywords. Seventeen published a question and answer piece titled "Why are my nipples hairy?", a question submitted by a fifteen year old reader (Seventeen, n.d.). The piece provided suggestions for removing unwanted hair and also wrote the following: "Some girls have extra hair due to an overabundance of hormones known as androgens, which may be overproduced by the ovaries or the adrenal gland. Sometimes in these cases, the period becomes abnormal, too. A gynecologist or adolescent medicine doctor can help check your hormone levels." Although the piece described PCOS symptoms, it did not refer to these as PCOS or polycystic ovary syndrome, and therefore, this article was not included in this study. It is unclear whether the piece in fact intended to describe PCOS and whether the name of the condition was intentionally omitted by Seventeen editors. In addition to developing a more rigorous search method and examining PCOS content over time, future research could also examine how readers respond to PCOS content in digital teen and women's magazines. This can include the ways in which readers respond to women's

personal stories with PCOS and manage their health, or not, as a result of exposure to this content. This may also include women's recommendations or discussions of the content with other women in other online media. For instance, Soul Cysters, an online social support site for women with PCOS and individuals interested in learning more about PCOS, features women's stories and user comments that reference women's magazines. For example, Soul Cysters

published a story entitled “A Magazine Article Turned Everything Around...” that featured an adolescent’s experience reading about PCOS in Cosmopolitan magazine (Soul Cyster, 2014). Additionally, a forum entry titled “PCOS success story in July 08 Shape Mag” expressed the user’s “love” for success stories, to which another user replied “Adding it to my list of magazines to buy!!” (NativeNYer, 2008). This form of social networking may direct audiences to teen and women’s magazines. Future research in this area is especially important considering that over 60% of internet users use social networking sites, and there is a rise in e-patients, which refers to internet users who use online content to make health and health care decisions such as how to cope and treat illness and whether to see a doctor after reading health content online (Rainie, 2012).

Conclusion

Digital media literacy is important in an age when most households in the U.S. are connected to and exposed to diverse forms of media, including Internet. In this environment, learning how to identify relevant and credible information and recognize how media filter information from a certain point of view, can assist consumers in deciding how to incorporate this information into their lives (Hobbs, 2010). Finding that women’s magazines reflect social values and beliefs about PCOS-related health and gender and personal responsibility, for instance, underscores the importance of media literacy for consumers of health media. Critical consumers of these media are characterized as having the skills to critically interact with media by accessing, understanding, appraising, and acting on certain information, rather than react as passive consumers. Consumers use their skill set to recognize how content is socially constructed and make informed health care decisions through reflection, questioning, and analysis of these media (Wharf Higgins & Begoray, 2012). This study can inform the

development of health education programs for consumers, particularly women of diverse racial and ethnic backgrounds, ages, and socioeconomic status, who read about PCOS content in digital women's magazines. For instance, it may be important for these consumers to be aware that intersectionality; which refers to the interactions between social categories like race, ethnicity, class, income, education, age, sexual orientation, and ability; influence health (Hankivsky, 2012), and intersectionality is largely absent from these magazines. Teaching women knowledge and skills to become critical consumers of these media can inform the ways they incorporate this content into their lives.

A second implication of this study is the potential, strategic use of digital women's magazines to promote women's health, particularly among racial and ethnic minority women. For instance, researchers have used women's magazines to recruit participants for research, as in the case of The Black Women's Health Study, a study of determinants of health among Black women in the U.S. This study enrolled participants through questionnaires mailed to subscribers of Essence magazine, a magazine directed toward African American women, among other sources (Krishnan, Cozier, Rosenberg, & Palmer, 2010). This approach facilitated the inclusion of Black women, groups with high rates of hypertension, type 2 diabetes, and stroke (Boston University, 2015), in research to improve Black women's health.

Historically, women's magazines have also been used as a medium for women to voice their concerns and advocate for women's health. For instance, in the mid-1970s, women wrote to Ms. Magazine describing their experiences with Dalkon Shield, an intrauterine device that led to spontaneous infected abortions and pelvic inflammatory disease, among other complications. The magazine also published stories of women's experiences with Dalkon Shield. Later, in the mid-1980s, Ms. Magazine published information about the National Women's Health Network's

Registry, a list of patients adversely affected by use of Depo Provera, the contraceptive discussed earlier in the results section. These created awareness about Depo Provera and garnered support for women's concerns about the drug's effects on women (Kline, 2011). Finding that digital women's magazines publish articles depicting women's experiences with PCOS as catalysts for advocacy can inform future efforts to promote women's health in the digital era.

Digital women's magazines also provided insight into the language and metaphors women use to communicate their experiences with PCOS. The use of a metaphor likening Courtney's experience with PCOS as boxing, for instance, reflects how metaphors facilitate patients' expression of their emotions and experiences with illness (McFarland, Barlow, & Turner, 2009). For instance, metaphors have helped patients with chronic disease such as diabetes and multiple sclerosis off-load or release emotions and articulate ways they manage their health (McFarland et al., 2009). Stroke recovery patients have described their recovery experience akin to war in that they had to fight, battle, or push themselves to regain physical functioning lost due to stroke (Boylstein, Rittman, & Hinojosa, 2007). Cancer survivors have depicted their progress toward health as a "journey" and develop identities as "survivors" having overcome disease (Appleton & Flynn, 2014, p. 380). Further understanding the language and metaphors women use to communicate their experiences with PCOS can help health educators and other providers understand women's self-efficacy, control, psychological well-being and identity development, and how these affect women's management of PCOS. As this study also found, incorporating video narratives, such as use of YouTube to "give infertility a voice", into digital magazines can help women with PCOS further voice and emote their experiences with PCOS.

Table 3.1. Alliance for Audited Media Magazine Publishers' Statements for the January 30, 2014 to June 30, 2014 Statement Period

Magazine	Field Served	Subscriptions (Digital Issue)	Single Copy Sales (Digital Issue)	Total Average Paid and Verified Circulation (Print and Digital Issue)
Better Homes and Gardens	"BETTER HOMES AND GARDENS inspires women with infinite possibilities for creativity and self-expression. Each issue delivers smart, approachable editorial on design and individual style, decorating and gardening, food and entertaining, and personal and family well-being."	102,080	11,486	7,639,661
Cosmopolitan	"COSMOPOLITAN focuses on personal growth, relationships and careers, with expanded reporting on fashion and beauty, health and fitness. Covered as well are celebrities and pop culture…and just about everything else women want to know about."	124,121	30,157	3,019,778
Cosmopolitan en Español	"The assertive magazine for the independent Latin woman. Forward. Innovative. Successful. The Cosmo woman is all this and much more! COSMOPOLITAN EN ESPAÑOL, published as part of a joint venture with the Hearst Corporation, helps its readers to successfully balance their professional and personal lives. Editorial emphasis is on beauty, fashion and looking sensational."	15,666	17	224,200
Essence	"A lifestyle magazine for today's African-American Woman."	21,057	2,738	1,083,461
Family Circle	"FAMILY CIRCLE speaks to moms of tweens and teens. FAMILY CIRCLE delivers advice for tough parenting challenges; provides suggestions for family activities; offers quick and healthy family recipes; and showcases projects to create a comfortable home. FAMILY CIRCLE features the latest health, diet, fitness and style news; and offers beauty and fashion tips."	30,434	7,626	4,015,728

Fitness Glamour	"A women's magazine addressing fitness as a lifestyle."	41,521	10,437	1,520,501
	"Every issue of GLAMOUR includes news-making coverage of beauty, fashion, health and relationships as well as women's issues, work, money and more."	41,662	22,505	2,318,521
Good Housekeeping	"Woman, Her Home and Her Family."	30,088	21,849	4,315,330
Health	"HEALTH is the magazine for women who have discovered a new kind of healthy living. It provides information and inspiration on all aspects of healthy living – from cutting-edge health ideas to food, fitness, beauty and relationships."	15,899	10,067	1,357,542
MORE	"MORE magazine is a fashion, beauty, trend and health guide for women of influence."	27,617	7,926	1,319,845
O, The Oprah magazine	"O, THE OPRAH MAGAZINE covers 360 degrees of a woman's life, from fashion and beauty, to relationships, food, home design, books, health and fitness, work and finance, technology, self-discovery and caring for others. The magazine encourages the reader to embrace her life, with the goal of becoming more of who she really is."	71,973	27,339	2,385,199
Parents	"PARENTS – the magazine mothers with young children turn to for guidance and information needed to raise happy, healthy, well-adjusted children."	25,132	3,612	2,125,414
Parenting *	"Reality-tested ideas and support for moms, by moms."	91,835	513	2,245,062
Prevention	"Women's magazine with interest in good health and personal fitness. Editorial focus on healthful foods, meal planning and preparation, nutrition, skin and body care, self-improvement and other topics contributing to a healthful lifestyle."	42,267	29,995	2,826,547
Redbook	"REDBOOK makes great style accessible for women aged 25 to 54. Editorial coverage includes beauty, fashion, home décor, fitness and nutrition, money management, relationships and personal growth."	15,904	14,219	2,221,393

Self	"SELF is the magazine about the healthy well-being of the whole woman – body, mind and emotions. It encompasses everything that makes her unique, from her passions to her personal style."	31,788	15,388	1,515,880
Shape	"Young, educated, affluent women leading active lifestyles who use fitness, fashion, and beauty to be their best."	261,747	34,410	1,638,925
Teen Vogue	"A fashion and beauty magazine for teen girls. With a focus on fashion, coverage also includes entertainment and music, health and beauty, and inspiring profiles."	9,649	5,438	1,011,323
Women's Health	"The WOMEN'S HEALTH brand was created for the woman who sees being healthy – physically and emotionally – as her edge. Our voice is how women speak to each other – with a tone and look that is uniquely WOMEN'S HEALTH."	63,228	39,183	1,537,140
Woman's Day	"Woman's Service Field."	21,408	18,719	3,288,335
Vandidades	"A women's beauty, fashion and lifestyle magazine in the U.S. Hispanic market. VANIDADES addresses the myriad interests of today's woman. Beauty and fashion are at the forefront, featuring the most recent developments in cosmetology and the latest offerings from the most renowned fashion designers."	61,284	23	540,259
* Publisher's Statement only available for the January 30, 2013 to June 30, 2013 statement period				

Table 3.2. Readership Gender, Age, Race/Ethnicity, and Education/Employment Demographics taken From Magazine Media Kits

Magazine Name	Gender	Age (years)	Race/ethnicity	Education/Employment
Better Homes and Gardens	Adults: 39,376 (100%) Women: 31,499 (80%) Men: 7,876 (20%)	18-34: 8,631 (21.9%) 18-49: 18,849 (47.9%) 25-49: 15,872 (40.3%) 35-49: 10,218 (25.9%) 25-54: 20,468 (52.0%) Median Age: 51.02	NA	Attended/Graduated College+: 24,260 (61.6%) Graduated College+: 11,051 (28.1%) Employed: 22,399 (56.9%); Dual Income Household: 10,924 (27.7%)
Cosmopolitan	Adults: 16,969,000 Women: 14,609,000	18-24: 3,746 (25.6%) 25-34: 3,654 (25.3%) 18-34: 7,414 (50.7%) 18-49: 11,360 (77.8%) Median Age: 34.7	NA	Attended/Graduated College: 9,617 (65.8%) Employed: 9,256 (63.4%)
Essence	Audience: 7,721,000	18–34: 2,627 (34%) 18–49: 5,186 (67.1%) 25–49: 4,216 (54.6%) 35–54: 3,483 (45.1%) Median age: 42.1	NA	Any College: 4,638 (60%) Employed: 4,851 (62.8%) Professional/Managerial: 1,769 (22.9%)
Family Circle	Women: 16.273	18-34: 1,933 18-49: 6,300 25-49: 5,967 25-54: 7,782 Median Age: 55	NA	Any College: 9,624
Fitness	NA	18-24: 17% 18-34: 39% 18-49: 74% 25-49: 58% 25-54: 67% 35-54: 45% Median age: 40	NA	Attended/Graduated College+: 63%
Glamour*	Female: 71% Male: 29%	Median age: 35.6	NA	Any College: 75%

Good Housekeeping	Adults: 17,084 (100%); Total Women: 15,502 (90.7%); Total Men: 1,582 (9.3%)	Total Women: 18-34: 1,768 (11.4%) 18-49: 5,863 (37.8%) 35-49: 4,094 (26.4%) 35-54: 5,816 (37.5%) 25-54: 7,202 (46.5%) 50+: 9,639 (62.2%) Median Age: 55.5	White: 12,940 (83.5%); Black/African-American: 1,588 (10.2%); Spanish/Hispanic Origin: 992 (6.4%)	Attended/Graduated College: 9,479 (61.1%); High School Graduate/Equivalent: 14,408 (92.9%)
Health *	Women: 78% Men: 22%	25-54: 52% 35-49: 23% 35-54: 36% Age 35+: 74% Median Age: 49	NA	Grad College +: 38% Any College: 76% Employed: 63%
MORE	Women: 1,608 (100%)	Age 25–49: 547 (34%) Age 25–54: 815 (51%) Age 35+: 1,422 (88%) Median Age: 54	NA	Attended College: 1,252 (78%) Graduated College+: 839 (52%)
MORE (Affluent Reader)	Women: 626 (100%)	Age 25–54: 339 (54%) Age 35+: 588 (94%) Median Age: 54	NA	Professional/Managerial: 397 (63%) Married: 527 (84%) Attended College: 592 (95%) Graduated College+: 480 (77%)
O' The Oprah Magazine "A Desirable Audience"	Total audience: 11,889,000 Female: 88% Male: 12%	18-34: 2,359 (20%) 35–44: 1,981 (17%) 45-54: 2,861 (24%) 18-49: 5,778 (49%) 24-54: 6,294 (53%) 55+: 4,689 (39%) Median age: 50.6	African Americans: 4,095 (34%)	Any college: 8,553 (72%) Employed: 7,278 (61%) Professional/Managerial: 3,550 (30%)
Parents	Women: 11,400,000	18-34: 5,742 (50%) 18-49: 9,214 (81%) 25-49: 7,745 (68%) 25-54: 8,441 (74%) Median Age: 34.9	NA	Attended/Graduated College+: 7,331 (64%) Graduated College+: 3,457 (30%) Employed: 6,702 (59%)

Prevention	Total Audience: 8,621,000 Female: 83% Male: 17%	Age 18-49: 30% Age 25-54: 41% Age 35-54: 34% Age 35-64: 59% Age 35+: 90% Median Age: 57	NA	Attended College: 67% Graduated College+: 34% Employed: 51%
Redbook	Women 18+: 6,019,000	Age 35-49: 1,722 (28.6%); GenXers (born 1965-1976): 1,312 (21.8%)	NA	Woman Views Work as a Career: 2,378 (39.5%)
Self *	Female: 62% Male: 38%	Median Age: 42	NA	College Educated: 71% Employed (Full Time or Part Time): 42%
Shape	Audience: 5,600,000	18-49: 77% 25-49: 66% 25-54: 76% Median Age: 39.6	NA	College Educated: 80% Employed: 74% Professional/Managerial: 70%
Teen Vogue *	Female: 73% Male: 27%	Median Age: 27	NA	Attended/Graduated College: 62% Employed: 50%
Vanidades	Female: 94% Male 6%	18-24: 8% 25-34: 25% 35-44: 20% 45-54: 19% 55+:28% Average age: 40 Median age: 39	<u>Language spoken in home:</u> Spanish dominant: 77%; Bilingual: 22%; English dominant: 9% <u>Country/Region of birth:</u> Mexico: 40%; South America: 12%; United States: 11%; Central America: 8%; Cuba: 6%; Dominican Republic: 4%; Puerto Rico: 3% Other: 16%	Attended / Graduated College+: 77% Graduated High School: 32%

Woman's Day	Adults: 18,793 Women: 17,724 (94.3%)	18-34: 2,128 (11.3%) 18-49: 6,793 (36.1%) 25-54: 8,613 (45.8%) Median Age: 55.5	NA	Attended/Graduated College+: 10,287 (54.7%) Employed: 9,255 (49.2%)
Women's Health*	eNewsletter Subscribers: 532,000+	Median Age: 33	NA	Any College: 82% Graduated College: 56% Employed: 60%
Note: * Readership demographics for digital (web) issue audiences provided when available. Media kit for Cosmopolitan en Español and Parenting unavailable.				

Table 3.3. Readership Marital Status, Children, and Home Ownership Demographics taken from Magazine Media Kits

Magazine Name	Marital Status	Children	Home Ownership
Better Homes and Gardens	Married: 23,269 (59.1%)	Parent: 12,477 (31.7%) Families: (Married and Parent) 9,020 (22.9%) Any Child Under 18: 15,265 (38.85)	Own Home: 28,639 (72.7%) Median Home Value: $200,106
Cosmopolitan	Single: 5,826 (39.9%) Married: 6,223 (42.6%)	Women with Children: 7,316 (50.1%) Working Women with Children: 4,426 (30.3%)	NA
Essence	Married: 2,687 (34.8%) Single/Widow/Divorce/Separated: 5,034 (65.2%)	Any Children: 3,535 (45.7%)	Own Home: 3,575 (46.3%)
Family Circle	Married: 10,004	Parent: 4,888 Household w/ kids 6 Years or Younger: 2,596 Household w/ Tweens/Teens: 4,603	Own Home: 12,528 Median Home Value: $180,615
Fitness	Married: 52%	Any children: 53%	Own Home: 58% Median Home Value: $208,532
Glamour*	Married: 48% Not married: 52%	Any children: 45%	NA
Good Housekeeping	Married 9,505 (61.3%)	Mothers: 4,277(27.6%) One or More Children in the Household: 5,233 (33.8%)	Own Home: 11,520 (74.3%) Home Value: $100,000+:9,363 (61.1%)
Health *	Married: 57%	NA	Own Primary Residence: 71%
MORE	Married: 1,005 (62%)	NA	Own Home: 600 (96%) Median Home Value: $417,251
MORE (Affluent Reader)	Married: 575 (84%)	NA	Own Home: 600 (96%) Median Home Value: $417,251
O' The Oprah Magazine "A Desirable Audience"	NA	Children in household: 4,323 (36%)	NA
Parents	NA	Any Kids: 8,925 (78%) 2+ Children in Household: 5,940 (52%) Average Age of Kids: 7.3	Median Home Value: $183,116

Prevention	Married: 58%	Children in household: 28% Under Age 12: 17% Age 6-17: 25% Age 12-17: 18%	Own Home: 76%
Redbook	Married or Engaged: 3,612 (60.0%) Dual HHI: 1,810 (30.1%) Women 35-49 & Married or Engaged: 1,172 (19.5%)	NA	NA
Self *	NA	NA	NA
Shape	Single: 31%	Any Children: 52%	NA
Teen Vogue *	NA	NA	NA
Vanidades	Married: 61%	Children in Household: 59%	Home ownership: Rent: 54% Own: 43% Live with Parents/Family: 3%
Woman's Day	NA	Any: 6,140 (32.7%) Under 6 years: 2,295 (12.2%) Ages 6-17: 5,234 (27.9%)	Own Home: 13,266 (70.6%) Home Value 100,000+: 10,505 (55.9%)
Women's Health*	NA	NA	NA
Note: * Readership demographics for digital (web) issue audiences provided when available. Media kit for Cosmopolitan en Español and Parenting unavailable.			

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Chapter 4

Conclusion

In addition to health care providers, individuals look to a variety of other sources, including the Internet and magazines, for health information (Cutilli, 2010; Hesse et al., 2005). Understanding health information seeking among individuals with chronic conditions is particularly important given that number of chronic conditions is associated with frequency of internet use to search for health information (Ayers & Kronenfeld, 2007). Polycystic ovary syndrome is comorbid with a number of conditions including mood and anxiety disorders (Dokras, 2012) and the metabolic syndrome (e.g., obesity, hypertension), and it increases women's risk of type 2 diabetes, pregnancy complications, endometrial cancer, and cardiovascular disease (Hardy, De Sousa, & Norman, 2013). However, studies on the online health-seeking behavior of women with PCOS and related comorbidities are lacking. This is an important area for future research as women with PCOS are significantly more likely to report impairment due to chronic illness and less likely to use self-help methods to manage their health, compared to women without PCOS (Kozica, Gibson-Helm, Teede, & Moran, 2013). The internet may facilitate help-seeking behavior among women with PCOS and related comorbidities.

In fact, online health information seeking has been found to reduce stigma associated with seeking health care. For instance, people with stigmatized illnesses (e.g., anxiety, depression, herpes) are more likely to search the internet for health information and utilize health services as a result of information found online, compared to those without stigmatized illnesses

(Berger, Wagner, & Baker, 2005). Polycystic ovary syndrome can be a stigmatizing condition, a "thief of womanhood", that challenges women's perceptions of beauty, femininity, and womanhood due to symptoms like irregular or absent menstrual periods, hirsutism, and infertility (Kitzinger & Willmott, 2002, p. 359). Research suggests that women search the internet for information on PCOS (Mousiolis, Michala, & Antsaklis, 2012). However, further research is needed to better understand how sociodemographic and cultural factors influence health information seeking and the use of this information to make health and health care decisions (Cutilli, 2010), particularly among women who experience stigma related to PCOS.

The internet has become an important part of the health care landscape, and online health information is changing the nature of health care. For instance, patients are increasingly integrating online health information to diagnose and treat their own medical conditions (Ferguson, 2007), learn about health insurance (Neter & Brainin, 2012), network with other patients (Smith, Graedon, Graedon, Grohol, & Sands, 2013), and decide whether to seek medical care (Wald, Dube, & Anthony, 2007). As a result, people have opportunities to become internet informed patients, also known as e-patients, which refers to active consumers of online media that incorporate information about diagnosis, prognosis, and treatment into their health care experience (Guillamon, Armayones, Hernandez, & Gómez-Zuñiga, 2010; McMullan, 2006). Examining characteristics of e-patients among women with PCOS is an important area for future research given that women with PCOS use the internet to access information and advice, inform decisions about treatment, and improve health management (Holbrey & Coulson, 2013).

Online health related information can also mediate the patient-provider relationship when patients discuss health information with health care providers (Wald, Dube, & Anthony, 2007). Providers may respond differently to online health information patients present them with. For

instance, some providers may be interested and involved in the conversation, agree with the patient or the information, take the patient seriously, and validate the patient's efforts to talk about the information. Other providers may disagree with the patient or the information, be dismissive or argumentative, and issue warnings about the dangers of online information. Patients report increased satisfaction interacting with health care providers when providers validate them for talking about information they found online and take the information seriously (Bylund, Gueguen, Sabee, Imes, Li, & Sanford, 2007). In light of findings that women with PCOS tend to feel neglected by health care providers (Ekbäck, Engfeldt, & Benzein, 2011), future research should examine how presenting providers with information women find online may, both positively and negatively, affect the patient-provider relationship in PCOS-related clinical encounters.

The growing digital landscape creates opportunities for innovative approaches to improve the population's health, particularly mental and behavioral health (Hyatt, 2015). Health interventions delivered online have the potential to reduce health service costs, increase convenience for users, provide timely information, and reduce stigma associated with health seeking (Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006). Additionally, digital health services can provide safe and anonymous spaces for patients to participate in peer support groups, communicate with trained providers including social workers and psychologists, and access evidence-based educational materials on mental health topics (Hyatt, 2015). These approaches can supplement face-to-face contact with health care providers (Griffiths et al., 2006).

While literature on online health interventions for women with PCOS is lacking, research suggests that online peer support groups and forums play an important role in women's help

seeking behavior. For instance, a peer-to-peer online support group for women with PCOS that facilitates discussion, information exchange, and peer-led discussion forums can help women connect with others who share their experiences and build confidence in interactions with health care providers. However, reading about others' negative experiences and difficulty joining conversations and engaging with other members can be disempowering for some women (Holbrey & Coulson, 2013). Women with PCOS also tend to describe their experiences with psychologists and other mental health providers in online forums. For instance, some women have expressed confusion about where to find professionals or specialists and concerns that therapists do not understand them or their symptoms. Women on online PCOS forums also share positive experiences with couples counseling for infertility and treatment for depression, poor body image, emotional eating, panic attacks, and eating disorders. Women with PCOS also advise other forum users to seek professional help and counseling for mental health problems (Niemi, 2011). Further research on women's use of online peer support groups and forums can inform the development of online health interventions for women with PCOS.

In the U.S., the strategic use of edutainment has been effective in promoting public health. For instance, given that a large percentage of Americans learn about health from television, the CDC has developed the Entertainment Education Program to collaborate with writers and producers to develop scripts with health-related storylines (CDC, 2015). Additionally, use of fotonovelas, a type of soap opera in the form of booklets resembling a comic book with posed photographs and dialogue bubbles, has been successful in promoting women's health. For instance, fotonovelas have been used to increase depression literacy among Latinas (Hernandez & Organista, 2015) and an online fotonovela has been used to improve knowledge of human papilloma virus and cancer among Latinas (Macario & Matiella, 2015). Fotonovelas

have been successful largely due to readers' ability to identify with the fotonovela's story and characters in their preferred language (Hernandez & Organista, 2015).

To date, no studies testing the effectiveness of edutainment on women's PCOS-related health outcomes have been published. For instance, it is unclear how Olivia Ward's story about struggling with PCOS and infertility on the Biggest Loser influenced viewers' attitudes, beliefs, and behavior. Additionally, while fotonovelas have been developed to promote women's health literacy (Hinojosa et al., 2010), these do not tend to include information about PCOS. The second study in this paper also suggests that the influence of lifestyle journalism on women's health warrants further attention. Lifestyle journalism is a form of edutainment that provides consumers with goods, services, and factual information and advice in entertaining ways (Hanusch, 2012). This includes information about health, fitness, lifestyle, and health stories. While lifestyle journalism may not fit traditional definitions of journalism (Hanusch, 2012), this journalistic field can provide valuable insight into the health-related content target readers are exposed to. Magazine stories, in particular, are an effective mode for disseminating health messages to target audiences (Silk, Atkin, & Salmon, 2011).

Edutainment is also increasingly being incorporated in health care. For instance, a computer-based tool combining soap opera episodes and interactive learning modules administered in public hospitals has been found to assist newly diagnosed, low health literacy patients with early stage breast cancer, become better informed and clearer about their surgical options (Jibaja-Weiss et al., 2011). Edutainment has the potential to reduce barriers women with PCOS encounter when seeking health care including confusion about the condition's name and its symptoms (Teede, Gibson-Helm, Norman, & Boyle, 2014), shame and embarrassment showing one's body, and confusion regarding referrals to other physicians (Ekbäck, Engfeldt, &

Benzein, 2011). This requires a deeper understanding of how to develop culturally sensitive edutainment approaches for diverse groups of women with PCOS.

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