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Date

Women's empowerment and its relationship to current contraceptive use in low, lower-middle, and upper-middle income countries: A systematic review of the literature

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An abstract of a thesis submitted to the Faculty of the Rollins School of Public Health of Emory University in partial fulfillment of the requirements for the degree of Master of Public Health in Global Health, 2014.

Abstract

Women's empowerment and its relationship to current contraceptive use in low, lower-middle, and upper-middle income countries: A systematic review of the literature

By Courtney Mik`kel Peters

This study assesses the peer-reviewed literature on women's empowerment and its relationship to current contraceptive use in low, lower-middle, and upper-middle income countries as defined by the World Bank. Although the empirical evidence suggests a positive relationship between empowerment and contraceptive use, the concept of empowerment is inconsistently defined and operationalized. This study looks specifically at women's agency, or the influence in family decisions and freedom of movement, as expressions of women's empowerment. Using systematic database search strategies, we identified 358 titles and abstracts for screening. Twelve full-text articles published between 1996 and 2013 met our inclusion criteria. We included quantitative studies of women ages 15-49, and we considered only studies using contraceptive use at time of survey as an outcome. The majority of included studies used DHS or other nationally representative survey data for secondary analyses, and all studies based their analyses on cross-sectional data. Using a standardized data-extraction form and quality checklist, we discovered that the definition and measurement of women's empowerment vary widely. These inconsistencies lead to variable findings when assessing current contraceptive use as an outcome. Consequently, 33% of included studies showed consistently positive relationships of either decision making or freedom of movement with contraceptive use at time of survey; whereas the remainder found inconsistent relationships or no association. These results were not specific to

any geographic region; however, it is notable that no studies came from Latin America, Southeast Asia, or the Middle East. Overall, this systematic review demonstrated that higher levels of specific aspects of women's empowerment are associated with higher levels of contraceptive use at time of survey, particularly for freedom of movement. More research is needed using consistent measures of empowerment.

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Chapter 1: Introduction

1.1 Background and Rationale

The impact of women's empowerment on a myriad of health outcomes has been heavily addressed in the literature. However, the definition of women's empowerment has yet to be standardized, and inconsistencies in both theory and measurement have led to an extreme variance in outcomes among studies. Historically, women's empowerment has been conceptualized as women's "autonomy", which implied a sense of independence as opposed to interdependence (Heckert and Fabic 2013). This led to disagreement among the academic community because many women live in collectivist societies where independence is not necessarily seen as a benefit or factor included in empowerment. The definition of women's empowerment can change based on context, measurement tool, and a researcher's own background.

In recent decades, women's empowerment has often been conflated with women's "status", including educational attainment, economic assets, and a woman's ability to use her resources to achieve specified goals (Heckert and Fabic 2013). Yet, as Kabeer (1999) points out, empowerment has evolved into a three-tiered concept, including resources, agency, and outcomes. This paper looks at two components of agency, decision making and mobility, and assesses their role as an intermediary between resources and achievements. In this scenario, we have chosen current "modern" contraceptive use at time of survey as our achievement (or outcome).

1.2 Problem Statement

The effect of women's empowerment on varied reproductive health outcomes has been closely assessed throughout the years, but contraceptive use is of particular interest due to family planning's ability to greatly diminish the negative health impacts associated with early childbearing, poor birth spacing, and high fertility (Smith et al. 2009). Even with family planning's proven positive effects on maternal, child, and community health, in 2010, an astounding 131 million women in low income countries had an unmet need for contraception (defined as the total percentage of women with a desire to stop or postpone childbearing but are not using a contraceptive method to achieve these goals) (Guttmacher Institute 2013). The lack of access to contraception, including a woman's ability to obtain a family planning method, is particularly apparent in low income countries.

While there are numerous factors accounting for poor contraceptive uptake and adherence in low income countries, we speculate that women's empowerment, and in particular, agency, significantly contributes to a woman's current contraceptive use. By using agency as the intermediary between resources and achievements, we seek to understand how a woman's ability to make decisions and move freely impacts her likelihood of using contraception. It is of particular relevance to note that Kabeer (1999) noted the difference between a woman's ability to make a choice and her desire to make a choice. Therefore, we must examine the effect of inequality on the ability to make a choice, as opposed to the rationale behind certain choices (Kabeer 1999).

By viewing agency as an expression of an ability to choose as opposed to a pre-existing choice, we can better assess the reasons why women may or may not be using contraception. The success or failure of family planning programs is not only dependent on women's desire to use contraceptives but also on their ability to do so. This ability is both affected by and an expression of agency, particularly decision making and mobility. The simplistic approach of providing women contraceptives and expecting uptake is not only culturally insensitive but ignorant of other factors contributing to a woman's freedom of choice.

Yet, there is an established foundation that women's empowerment has a positive effect on current contraceptive use (Upadhyay and Karasek 2012). However, the results of studies are varied in their findings on agency's specific effect on current contraceptive use. Moreover, the bulk of the literature primarily assesses the impact of resource factors (e.g., education) on contraceptive use. Therefore, it is necessary to undergo a systematic review of the literature to analyze two identifiable problems: first, the need to identify the effect of decision making and freedom of movement on a woman's current use of a "modern" contraceptive method; second, the need to identify both consistencies and inconsistencies in the conceptualization, definition, and measurement of empowerment, with a particular focus on agency, and how these approaches impact reporting of our specified outcome.

1.3 Objectives

The overarching objective of this systematic review is to understand how family decision making and freedom of movement acts as components of agency to affect "modern" contraceptive use at the time of survey. As such, this project aims to:

1. Assess the definition and operationalization of women's empowerment, and particularly agency, in the empirical literature.
2. Evaluate the impact of two components of agency as defined by Kabeer (1999), decision making and freedom of movement, on "modern" contraceptive use at the time of survey.
3. Utilize these findings to make recommendations for future research on agency and contraceptive use, along with suggestions for improved public health programming related to women's empowerment and/or family planning.

We desire to produce a more generalizable concept of agency through this review, especially as it applies to contraceptive use. We anticipate that a streamlined definition for agency and recommendations for its measurement will help both the academic and programmatic communities by providing stronger assessment tools for women's empowerment, especially agency, and thereby, assist in creating tailored programs for promoting family planning use. Furthermore, we hope to better understand if decision making and freedom of movement have an equal effect on current contraceptive use or if one component of agency is stronger than the other. By reaching consensus on this question, it will be easier to make policy and program recommendations based upon the areas of agency with the most weight in influencing contraceptive uptake and usage.

We sought to understand the current state of contraceptive use, particularly in low income countries, with a focus on "modern" methods. We also desired to investigate past and current definitions of women's empowerment, including evolving opinions in both the research and political spheres. Finally, we hoped to investigate the link between women's empowerment, particularly agency, and its impact on reproductive health outcomes, with a focus on contraceptive use.

1.4 Purpose of the Project

Using available, peer reviewed literature; we propose the following hypotheses to be assessed with this systematic review:

1. Women with higher levels of decision making power as an expression of agency are more likely to use "modern" contraception.
2. Women with higher levels of freedom of movement as an expression of agency are more likely to use "modern" contraception.

The purpose of this project is to assess these two hypotheses, along with an evaluation of the definition and operationalization of agency as it related to "modern" contraceptive use.

While a plethora of studies exist on women's agency's impact on current contraceptive use, inconsistencies in definition and measurement make it difficult to compare the outcome across papers. Therefore, this study seeks to better understand the relationship between women's agency as a component of women's empowerment and its impact on current, "modern" contraceptive use. We accomplish this goal through a systematic literature search and review, followed by analysis. In an attempt to better understand the existing inconsistencies when defining women's agency (and overall empowerment), we will assess each study's use of terminology, relevant measurement and response items, and results.

1.5 Terminology

While women's empowerment and contraceptive use are not limited to low income countries, we limited our research to low, lower-middle, and upper-middle income countries. Other literature may use the term "developing" versus "developed" countries, but we feel this terminology is

both vague and not fully descriptive of the variance between countries. Therefore, we will use the World Bank's country classification by income and exclude discussion of countries whose gross domestic product exceeds $12,615 per capita (World Bank Group 2014). By abstaining from the inclusion of high income economies and high income OECD members, we acknowledge that health outcomes and pathways to care vary greatly by country of residence, particularly for those in lower income brackets.

Additionally, we will use the term "modern" contraception throughout this paper when defining our outcome. All references to contraception, current contraceptive use, or family planning will refer to modern contraception as defined by the World Health Organization. It is important to note that we are not considering the sole use of male condoms as a modern contraceptive method.

Chapter 2: Literature Review

2.1 Trends in Global Contraceptive Use

Globally, contraceptive use is on the rise, with an increase from 54.8% to 63.3% from 1990-2010 among married (or in a union) women ages 15-49 in 194 countries or areas (Alkema 2013). This figure varies between regions and lower versus higher income countries. Using model based median estimates, the United Nations published a contraceptive prevalence of 71.4% among women married or in a union ages 15-49 for 2012 for "more developed regions" (United Nations 2012). However, the opposite end of the spectrum, "less developed regions" has a modeled median contraceptive prevalence of 62.4% among women married or in a union ages 15-49 for 2012 (United Nations 2012). Even more disconcerting, "least developed countries" have a modeled median contraceptive prevalence of 36.7% among women married or in a union ages 15-49 for 2012 (United Nations 2012).

The gaps in contraceptive use are more apparent when assessing use of a "modern" contraceptive method. Using model-based median estimates for 2012, "modern" contraceptive prevalence is 62.2% among women ages 15-49 who are married or in a union in "more developed regions"; this percentage falls to 56.6% in "less developed regions" and to 30.2% in "least developed countries" (United Nations 2012). As we prefer to use the terminology low or lower income, the "least developed countries" can be considered comparable to low income countries. Using these figures, it is clear that significant gaps still exist within contraceptive prevalence, particularly between higher and lower income countries and regions.

These discrepancies in contraceptive prevalence or use are often described as the unmet need for family planning. Unmet need is defined as the total percentage of women with a desire to stop or postpone childbearing but who are not using a contraceptive method to achieve these goals (Alkema et al. 2013). Unmet need has also been declining, with a change from 15.4% to 12.3% over the same twenty year period among married (or in a union) women ages 15-49 in 111 countries or areas (Alkema et al. 2013). These changes are especially marked in lower income countries, where contraceptive prevalence increased from 51.8% in 1990 to 62.0% in 2010 and unmet need fell from 16.5% to 12.8% (Alkema et al. 2013).

Yet, large variations in unmet need still exist between regions. For instance, 25% of women in Sub-Saharan African have an unmet need for contraception, and the region has made little progress over the past two decades (United Nations 2013). Additionally, specific countries have a markedly higher unmet need than the general percentage for lower income countries, hovering around 20-29.9% of women (United Nations 2013). These include Bolivia, Guyana, India, Nepal, Pakistan, and multiple African countries, among others (United Nations 2013). Therefore, progress has no uniformly affected all countries, and many lower income countries and areas continue to suffer from high unmet need.

Method mix, or the different types of contraceptive methods available to women, is another key are of consideration when discussing contraceptive use. While method mix varies greatly from country to country, “modern” method use is generally includes generally includes combined oral contraceptives, progestogen only pills, implants, progestogen only injectables, both hormonal and cooper intrauterine devices, female and male condoms, female and male sterilization,

lactational amenorrhea, and emergency contraception (World Health Organization 2013). "Modern" method use has drastically increased over the past three decades but still has room for improvement (UNFPA n.d.). In "developing" or lower income countries, the use of the intrauterine device and oral contraceptive pill has declined from 1980-2005, but the use of injectables and condoms has seen a marked increase (Seiber, Bertrand, and Sullivan 2011). Particularly, female sterilization is common across Asia, Latin America, and the Caribbean, while Africa is domination by injectables and oral contraceptive pills (United Nations 2013).

Increased contraceptive use has frequently been linked to improved health outcomes. For example, findings from the twenty year longstanding project, Maternal and Child Health and Family Planning Program (MCH-FP), based in Matlab, Bangladesh have shown that access to family planning improves both maternal and child health, thereby producing a net positive effect on the community as a whole (Joshi and Schultz 2013). This project initially provided women with contraceptives delivered to their homes, along with supplementary services; other maternal and child health services were then added after the initial success of the family planning outreach. MCH-FP's intervention group, compared to those who did not receive maternal and child health and family planning services from the project, has consistently shown more extended birth spacing, lower risks of infant mortality, and in certain situations, these benefits were strong enough to spread into surrounding areas (Joshi and Schultz 2013). Family planning also has been shown to save lives. Ahmed and colleagues (2012) analyzed data from 172 countries and found that contraceptive use reduced maternal deaths by 44% in 2008, and if unmet need was fulfilled, there would be a further 29% reduction in maternal mortality.

Despite these advances, many women still lack access to contraceptives, particularly in lower income countries. An estimated 131 million women in low income countries had an unmet need for contraception in 2010 (Guttmacher Institute 2013). This gap can lead to an array of health problems including adolescent childbearing, maternal mortality and morbidity, and poor birth spacing as defined by less than two years between births (Smith et al. 2009). In fact, a woman in a lower income country has an estimated 1/75 lifetime risk of dying from pregnancy and/or childbirth, but family planning can reduce this risk by as much as one third (Smith et al. 2009). However, the most marginalized women are missing out on lifesaving services; one study of ten lower-income countries found that approximately half of government subsidized condoms and oral contraceptives went to those above the poverty line (Smith et al. 2009).

Consequently, top donors and policy makers have recognized the need for improved access to family planning. In the United Nations' report, 2011 World Contraceptive Use, 22% of Sub Saharan African and approximately 46% of South Asian women use a "modern" contraceptive method. Not surprisingly, family planning has been hailed as a partial solution for reaching the United Nations eight Millennium Development Goals (Darroch, Sedge, and Ball 2011). Cates (2010) points out family planning's ability to reduce demand for food and prolong education, among other items.

2.2 Women's Empowerment and Contraceptive Use

Women's empowerment and contraceptive use are intricately linked. Analyzing data from 73 Demographic and Health surveys, Darroch and colleagues (2011) found that of women ages 15-

49 and surveyed in Southeast Asia, South Central Asia and Sub-Saharan Africa 2008, 10% were not using a "modern" method because their partner disapproved, which underlines their powerlessness. Similarly, in her examination of Family Health International's Women's Studies Project, Williamson (1998) noted that husbands have "a critical role" in determining family planning uptake and use. Finally, Zafar (1996) found a far stronger link between women's status and contraceptive use among married Pakistani women ages 25 and above than between contraceptive use and economic factors.

Upadhyay and Hindin (2005) presented key results from numerous studies on women's status that identified a clear positive link between higher status (e.g., empowerment) and contraceptive use, along with a link between work outside the home and contraceptive use. In a similar study, other researchers point out the substantial collection of literature examining reproductive health outcomes, including contraceptive use, and women's empowerment (Upadhyay and Karasek 2012). The literature presents clear evidence that women's empowerment, including the ability to independently make decisions, affects contraceptive use.

Numerous studies have cited the positive relationship between women's schooling and lower fertility, with empowerment or improved status as a mediating factor (Chaudhury 1984; Hoque and Murdock 1997; Jejeebhoy 1995). A handful of studies have sought to assess empowerment as the stepping stone to achievements (e.g., family planning uptake) (Moursund and Kravdal 2003; Saleem and Bobak 2005). Others have looked at the independent associations of women's empowerment with these same achievements, which we seek to explore in more detail, here.

However, much of the literature looks at women's overall status, which is reflective of earlier concepts of empowerment that focused heavily on items like schooling attainment and economic resources (Heckert and Fabic 2013). As discussed below, these items are still included in the conceptualization, but before presenting the findings from our review of the relationship between women's empowerment and contraceptive use, we offer a working definition of empowerment, particularly in the framework of this study.

2.3 A Conceptual Framework

The term "women's empowerment" is widely used in public health and development contexts, and is often conflated with "autonomy" and/or "agency". Yet, as Kabeer (1999) acknowledges, women's empowerment is poorly defined and operationalized in the empirical literature, creating an area of "fuzziness" while still offering room for definitional development and refinement. These discrepancies extend beyond research into policy decisions, and the desire to consistently define and measure empowerment works concordantly with the desire to create effective programming and policies to help improve women's empowerment.

Many of the current definitions available for empowerment are geographically heterogeneous and do not offer an adequate representation of women in varied contexts. In example, Corroon and colleagues (2013) note, most of these definitions originate from South Asia-particularly Bangladesh, India, and Pakistan. By siloing the definition of empowerment in South Asia, we create a concept that is too culturally-specific and fails to present a broad conceptual framework for application elsewhere. Yet, the challenges in defining empowerment often step from the

incredible complexity of the word and the subjective interpretations offered of it by both those in the academic and policy communities. Particularly, Do and Kurimoto (2012) acknowledge the complexity of women's empowerment and note that the "considerable variation" makes a consistent definition extremely difficult, but key definitions from Kabeer and Malhotra have greatly informed the discussion and laid the groundwork for a working understanding of women's empowerment in the empirical literature (Kabeer 1999; Malhotra, Schuler, and Boender 2005).

Kabeer (1999) seeks to provide a definition for women's empowerment by conceptualizing it as a "process of change", which requires an individual to be disempowered before achieving empowerment. This process is expressed as a definition derived from Kabeer (1999), who operationalizes empowerment as three inter-related domains: resources, agency, and achievements. For this review, we will use the "agency" portion of the framework, and we define "women's agency" as a component of "women's empowerment" (Figure 1). Agency implies goal definition and execution, only made possible by the freedom to choose these goals (Kabeer 1999). As Figure 1 shows, agency includes decision making, freedom of movement, and gender attitudes (VanderEnde et al. nd; Yount et al. nd), of which we have chosen to focus on two: women's influence in decisions in the family (decision making) and women's freedom of movement in public spaces (freedom of movement).

We excluded women's attitudes about gender because this component of agency is expansive and would skew the review toward discussion around gender definition and equality, detracting from the other components of agency. We chose the term freedom of movement (as opposed to

mobility) to avoid any confusion with women's physical capacities. By opting for these two components of agency, we seek to better understand the process portion of women's empowerment. As Kabeer (1999) mentions, resources are the inputs, which then have the potential to enhance women's decision making and freedom of movement, and thereby enhance women's achievements.

In addition to defining women's empowerment, and more specifically, agency, it is important to assess measurement. Kabeer (1999) notes that agency is predominantly expressed as decision making or a woman's ability to make decisions. However, specific decisions vary greatly by country and/or region. Therefore, it is important to differentiate between decisions which may have a significant impact on a woman's empowerment and those which are fairly inconsequential; day to day decisions (e.g., food selection) are drastically less indicative of a woman's ability to consciously make choices than "strategic life choices" (Kabeer 1999). Consequently, this review seeks to examine the variance in decision making items and provide discussion on their ability to truly assess decision making power as an expression of actual choice and the process of change.

Nevertheless, the empirical literature shows that women with more decision making power are more likely to use contraceptives. In a clinical sample of Mexican women ages 18 and 49, Estrada and colleagues (2008) found that women's power to make decisions, along with improved partner communication, was both positively and significantly associated with contraceptive use. Conversely, in a study of Nepalese women with a mean age of 33 years, Chapagain (2006) found that decreased autonomy among women led to less control over their

body and reproductive health decisions. These studies emphasize the cultural and geographical diversity found in the relationship between women's empowerment and their ability to control key reproductive health decisions, including family planning use.

There is less speculation on freedom of movement's role in development of agency, and Kabeer (1999) offers fewer definitive comments on freedom of movement's ability to express women's process of change and autonomous choice. The absence of debate around freedom of movement as a measure of agency perhaps signifies more clarity or veracity in its use as an agency factor. To further emphasize freedom of movement's ability to effectively convey degrees of agency, Kabeer (1999) refers to freedom of movement as a "factual direct indicator" as opposed to decision making, which is more subjective.

Perhaps most importantly, we acknowledge the inherent unpredictable nature of human actions and behaviors. Kabeer (1999) notes that "human agency is indeterminate" and therefore, agency is extremely difficult to effectively measure. This undeniable truth accounts for much of the debate surrounding the definition and operationalization of women's empowerment, with a particular emphasis on agency. While we seek to understand a woman's possession of the power to make her own choices and the development of this power, multiple, ever-changing factors affect this power dynamic. Ultimately, we are assessing the choices (or lack thereof) of human beings, and it is imperative to remember the humanity implicit in studying any process of individual or group change dynamics.

2.4 Current Research Gaps

As mentioned above, the literature shows that various components of women's empowerment positively affect contraceptive use, and the benefits of contraceptive use are numerous. However, multiple factors affect a woman's ability and decision to use contraception. The literature has attempted to research the impact of women's empowerment, particularly agency, on these abilities and decisions to use contraception. Yet, women's agency is inconsistently defined across the literature and operationalized in very different ways. Therefore, this study seeks to understand better the relationship between women's agency as a component of women's empowerment and its impact on current, "modern" contraceptive use.

We accomplish this goal through a systematic literature search and review, followed by analysis. In an attempt to better understand the existing inconsistencies when defining women's agency (and overall empowerment); we will assess each study's use of terminology, relevant measurement and response items, and results.

Chapter 3: Manuscript

Women's empowerment and its relationship to current contraceptive use in low, lower-middle, and upper-middle income countries: A systematic review of the literature

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Student Contribution

This manuscript will be submitted for publication with multiple authors as follows: Kristin VanderEnde, MSN, CNM, PhD, Sara Thorpe, MPH Candidate, Lauren Bardin, MPH Candidate, Alan Bleiberg, Kathryn Yount, PhD. The authors worked collaboratively as a research team, providing support to one another as needed. As the lead researcher on this project, Courtney Mik`kel Peters made significant contributions to the manuscript, which are outlined below:

Research:

1. Conducted an initial systematic review of the literature using defined search terms
2. Refined search terms to focus the literature search and found 358 articles
3. Developed inclusion/exclusion criteria to further refine the available empirical literature
4. Produced multiple iterations of the inclusion/exclusion criteria, which were piloted on five articles
5. Finalized the inclusion/exclusion criteria and applied them to the remaining 97 articles, leaving 12 articles for inclusion

Data Extraction and Analysis:

6. Utilized an adapted data extraction and quality assessment form to extract all required data from the 12 included articles
7. Analyzed all relevant data from the 12 included articles by developing tables and reviewing statistical analyses
8. Refined tables extensively to produce the most apt picture of available data

Manuscript Construction:

9. Wrote all sections of the manuscript including: Abstract, Background, Methods, Results, Discussion, Conclusion, References, and Acknowledgements
10. Created or adapted all additional tables and figures for the manuscript
11. Produced numerous iterations of the manuscript based upon feedback from thesis advisor and committee member

ABSTRACT

Empirical evidence suggests a positive relationship between women's empowerment and contraceptive use, yet the concept of empowerment is inconsistently defined and operationalized. To address this gap in the literature, we conducted a systematic review of peer-reviewed literature on women's empowerment and current contraceptive use in low, lower-middle, and upper-middle income countries. Our systematic review focused on women's agency, specifically family decision making and freedom of movement. Twelve articles published between 1996 and 2013 met our inclusion criteria. We found high variability in the definition and measurement of women's empowerment, leading to inconsistent associations with the outcome, current contraceptive use at the time of the survey. Consequently, 33% of included studies showed consistently positive relationships of either decision making and/or freedom of movement with contraceptive use; whereas the remainder found inconsistent or no associations. This review highlights the need for additional research using consistent measures of women's empowerment.

BACKGROUND

Trends in Global Contraceptive Use

Globally, contraceptive use is on the rise, with an increase from 54.8% to 63.3% from 1990-2010 among married (or in a union) women ages 15-49 in 194 countries or areas (Alkema et al. 2013). Unmet need, defined as the total percentage of women with a desire to stop or postpone childbearing who are not using a contraceptive method to achieve these goals, has been declining globally, with a change from 15.4% to 12.3% over the same twenty year period (Alkema et al. 2013). These changes are particularly notable in lower income countries, where contraceptive

prevalence increased from 51.8% in 1990 to 62.0% in 2010 and unmet need fell from 16.5% to 12.8% over the same period (Alkema et al. 2013). While method mix varies greatly from country to country, "modern" method use (generally includes combined oral contraceptives, progestogen only pills, implants, progestogen only injectables, both hormonal and cooper intrauterine devices, female and male condoms, female and male sterilization, lactational amenorrhea, and emergency contraception) has drastically increased over the past three decades (World Health Organization 2013; UNFPA n.d.). Globally, the use of intrauterine devices (IUD) and oral contraceptive pills has declined from 1980-2005, but the use of injectables and condoms has seen a marked increase (Seiber, Bertrand, and Sullivan 2011).

Increased contraceptive use has been linked to improved health outcomes. For example, findings from the longstanding Maternal and Child Health and Family Planning Program (MCH-FP) based in Matlab, Bangladesh have demonstrated that access to family planning improves both maternal and child health, producing a net positive effect on the community as a whole (Joshi and Schultz 2013). This project, which initially provided women with contraceptives delivered to their homes, subsequently added other maternal and child health services after the initial success of the family planning outreach. MCH-FP's intervention group, compared to those who did not receive maternal and child health and family planning services from the project, has consistently shown more extended birth spacing and lower risks of infant mortality. In certain situations, these benefits spread into surrounding areas (Joshi and Schultz 2013). Family planning also has been shown to save lives. For example, Ahmed and colleagues (2012) analyzed data from 172 countries and found that contraceptive use reduced maternal deaths by 44% in 2008. They

posited that if unmet need was fulfilled, there would be a further 29% reduction in maternal mortality (Ahmed et al. 2012).

Despite these advances, many women still lack access to contraceptives, particularly in lower income countries. An estimated 131 million women in low income countries had an unmet need for contraception in 2010 (Guttmacher Institute 2013). This gap may lead to an array of health problems including adolescent childbearing, maternal mortality and morbidity, and poor birth spacing (less than two years between births) (Smith et al. 2009). In fact, a woman in a lower income country has an estimated 1/75 lifetime risk of dying from pregnancy and/or childbirth, but family planning may reduce this risk by as much as one third (Smith et al. 2009). However, the most marginalized women are still missing out on lifesaving services. In a study of ten lower-income countries, Smith and colleagues (2009) found that approximately half of government subsidized condoms and oral contraceptives went to those above the poverty line. Consequently, top donors and policy makers have recognized the need for improved access to family planning, which has been hailed as a partial solution for reaching the United Nations Millennium Development Goals (Darroch, Sedge, and Ball 2011). In addition to improving women's health, family planning has also been suggested as a means to reduce demand for food and prolong education (Cates 2010).

Women's Empowerment and its Effect on Contraceptive Use: A Conceptual Framework

Women's empowerment and contraceptive use are intricately linked. Analyzing data from 73 Demographic and Health Surveys (DHS), Darroch and colleagues (2011) reported that 10% of

women ages 15-49 surveyed in Southeast Asia, South Central Asia and Sub-Saharan Africa in 2008 were not using a "modern" method because their partner disapproved. Similarly Williamson (1998) noted that husbands have "a critical role" in determining family planning uptake and use. Finally, Zafar (1996), examining contraceptive use among married Pakistani women ages 25 and older, found a stronger link between women's status and contraceptive use compared to economic factors and contraceptive use. In a paper examining the relationship between women's autonomy and birth to conception intervals, Upadhyay and Hindin (2005) presented key results in their discussion from numerous studies on women's status that identified a clear positive link between higher status (e.g., empowerment) and contraceptive use, along with a link between work outside the home and contraceptive use. In a study also examining women's empowerment and reproductive health outcomes, particularly desired family size, other researchers point out the substantial collection of literature examining reproductive health outcomes, including contraceptive use, and women's empowerment (Upadhyay and Karasek 2012). The literature presents clear evidence that women's empowerment, including the ability to independently make decisions, affects contraceptive use. However, much of the literature looks at women's overall status, which is reflective of earlier concepts of empowerment that focused heavily on items like schooling attainment and economic resources (Heckert and Fabic 2013).

The term "women's empowerment" is widely used in public health and development contexts, and is often conflated with "autonomy" and/or "agency". Women's empowerment is also poorly defined and operationalized in the literature, and as Corroon and colleagues (2013) note, most of these definitions originate from South Asia - particularly Bangladesh, India, and Pakistan. Do and Kurimoto (2012) acknowledge the complexity of women's empowerment and note that the

"considerable variation" makes it difficult to develop a consistent definition for women's empowerment.

For this review, we define "women's agency" as a component of "women's empowerment" (Figure 1). This definition is derived from Kabeer (1999), who operationalizes empowerment as three inter-related domains: resources, agency, and achievements. As shown in Figure 1, agency is a multidimensional construct including women's decision making, freedom of movement, and gender attitudes (VanderEnde et al. nd; Yount et al. nd). For the purposes of this systematic review, we have chosen to focus on women's influence in decisions in the family (decision making) and women's freedom of movement in public spaces (freedom of movement). We excluded women's attitudes about gender as this component of agency is expansive and would skew the review toward discussion around gender definition and equality, detracting from the other components of agency. We use the term freedom of movement (as opposed to mobility) to avoid any confusion with women's physical capacities. By opting for these two components of agency, we seek to better understand the process portion of women's empowerment. As Kabeer (1999) notes, resources are the inputs, which then have the potential to enhance women's decision making and freedom of movement, and thereby enhance women's achievements.

Numerous authors have cited the positive relationship between women's schooling and lower fertility, with empowerment or improved status as a mediating factor (Chaudhury 1984; Hoque and Murdock 1997; Jejeebhoy 1995). A handful of researchers have sought to assess empowerment as the stepping stone to achievements (e.g., family planning uptake) (Moursund and Kravdal 2003; Saleem and Bobak 2005). Others have looked at the independent associations

of women's empowerment with these same achievements, which we seek to explore in more detail.

Current Research Gaps

As mentioned above, evidence from empirical literature highlights the positive associations between components of women's empowerment and women's contraceptive use. Likewise, the benefits of contraceptive use are well documented. However, multiple factors may impact a woman's ability and decision to use contraception. While researchers have examined the impact of women's empowerment, particularly agency, on decisions to use contraception, this research is limited by inconsistent definitions and measurement of women's agency. To address this gap in the literature, this systematic review seeks to understand better the relationship between women's agency as a component of women's empowerment and its impact on current, "modern" contraceptive use. In an attempt to better understand the existing inconsistencies when defining women's agency (and overall empowerment), we will assess each study's use of terminology, relevant measurement and response items, and results.

METHODS

Search Terms, Databases, and Search Strategies

As a first step in this systematic review, we piloted and revised a set of a search terms (Figure 2). We used the "NOT" in our search terms to exclude articles focused on abortion, condom use for

the prevention of sexually transmitted infections (STI), and studies related to HIV/AIDS. We searched two popular scientific databases, PubMed and Web of Science, along with two additional databases targeting women's issues, Popline and Women's Studies International. These search terms and databases yielded 358 articles that met the initial inclusion criteria for more formal review.

Inclusion/Exclusion Criteria

We included peer-reviewed articles, published in English and/or Spanish, from January 1, 1980 to October 1, 2013 (Table 1). Due to the authors' linguistic limitations only articles in English and Spanish were included. Inclusion criteria included a focus on women between the ages of 15-49, and the analysis of data from at least one low income, lower-middle income, or upper-middle income country (as defined by The World Bank Group 2014). Multi-country studies were included provided that at least one of the countries met the inclusion criteria. Our review was limited to quantitative, population-based studies that used at least multivariate linear regression or another advanced form of analysis which allowed for controls and multiple models (Table 1).

We defined the outcome, current contraceptive use at time of survey, as women who were using a "modern" method at the time of the survey (see Figure 3). We used an established definition (World Health Organization 2013) with the exception of withdrawal, which we included as a "modern" method and lactational amenorrhea, which we did not include. Although male condoms are a "modern" method, we excluded studies addressing only male condom use to avoid a disproportionate focus on HIV and STI prevention as opposed to women's empowerment. Additionally, we included studies that focused on both "modern" and

"traditional" family planning methods if the former were used in a separate analysis. Furthermore, studies with a vague definition or with no definition of contraception were included if they met all other inclusion criteria. The exposure, women's agency, included women's decision-making and freedom of movement, as defined by Kabeer (1999) and described previously. We excluded economic decision making, with the exception of household purchases. Our inclusion/exclusion criteria are presented in Table 1.

Study Selection

After piloting the inclusion/exclusion criteria with a 5% random sample (5 articles), two researchers (AB and CP) independently screened the full text of 102 articles, with any differences resolved through discussion and consensus. A total of 12 articles meet the inclusion criteria (Figure 4).[i] We also executed two secondary search strategies: key author and reference searches. Neither yielded any additional articles meeting the inclusion criteria.

Data Extraction & Quality Measures

We developed standardized forms for data extraction, including a separate form for quality measures (Cochrane Review 2007). Using these forms, one researcher (CP) extracted from each included article demographic information, study-specific information, exposure and outcome measures, statistical analyses used and relevant ratios, and identified conclusions, limitations, and recommendations. To assess quality and provide each study with a quantifiable ranking, we adapted the STROBE (Strengthening the reporting of observational studies in epidemiology) Checklist for Cross Sectional Studies (STROBE 2007). The checklist consists of 22 items, and we assessed each study using the same criteria. The findings and scores are discussed in the following section.

Analysis

After extracting all relevant data, we generated a set of tables to categorize and present the results. Data from the extraction forms were analyzed and presented in descriptive tables.

RESULTS

Characteristics of Included Studies

Of the 12 included studies, approximately 67% were published in 2001 or later, and none were published before 1991 (Table 2). The majority of studies (50%) included data from lower middle income countries, and only four studies focused on low income countries (Bogale et al. 2011; Deb, Kabir, and Kawsar 2011; Hindin 2000; Hogan, Berhanu, and Hailemariam 1999). Two studies (Ahmed et al. 2010; Do and Kurimoto 2012) are multi-country analyses and therefore, fit into more than one classification. Almost all studies (92%) were secondary data analyses, and half of all studies had analyses using DHS data. The authors of two of these studies (Ahmed et al. 2010; Do and Kurimoto 2012) both used the 2006 Uganda DHS in their multi-country analyses. The authors of two studies from India (Dwivedi and Sogarwal 2008; Guntupalli and Nangia 2008) both used the same National Family Health Survey (NFHS-2) data for their analyses. Only one author (Bogale et al. 2011) used primary data. Consequently, 92% of the studies were based on secondary cross sectional survey data, and Bogale and colleagues (2011) similarly analyzed cross sectional survey data collected by their research team.

The studies were not geographically diverse. A third of the authors used data from African countries, including Ethiopia (Bogale et al. 2011; Hogan, Berhanu, and Hailemariam1999), Nigeria (Corroon et al. 2013), and Zimbabwe (Hindin 2000). Approximately 42% of studies contained data analyses from South Asia including three studies from India (Dwivedi and

Sogarwal 2008; Guntupalli and Nangia 2008; Jejeebhoy 2002), one from Bangladesh (Deb, Kabir, and Kawsar 2011), and one from Pakistan (Mahmood and Ringheim 1996). One study included data from Egypt (Govindasamy and Malhotra 1996), and the authors of two studies relied on data from multiple countries (Ahmed et al. 2010), one of whom looked only at African countries (Do and Kurimoto 2012). There was no representation of populations in Latin America, Southeast Asia, or the Levant region of the Middle East.

The majority of authors (58%) used multivariate logistic regression to analyze data, and two (17 %) used multivariate multinomial regression (Do and Kurimoto 2012; Govindasamy and Malhotra 1996). The remaining studies included a combination of multivariate logistic regression and other advanced statistical methods, which allowed for controls and multiple models (Ahmed et al. 2010; Corroon et al. 2013; Hindin 2000). For the purposes of this review, however, only the results from the multivariate regression models were compared, to allow for more precise comparison across studies using adjusted odds ratios.

Data Quality

A wide range of tools exist to assess data quality among cross sectional studies, and quality can be difficult to measure. However, the STROBE checklist provided us with a standardized way to rank studies based upon established criteria (STROBE 2007). Included articles were of variable quality, and overall scores for quality ranged from 10 (Guntupalli and Nangia 2008) to 19 (Corroon et al. 2013) out of 22 possible points. To better present these quality measures, we categorized studies by low (0-13 points), medium (14-16 points), and high (17-22 points) quality.

According to our criteria, four articles were of low quality (Ahmed et al. 2010; Deb, Kabir, and Kawsar 2011; Guntupalli and Nangia 2008; Hindin 2000). In general, these analyses could have

been improved by: 1) providing detailed information on data sources and measurement for each variable of interest; 2) including an assessment of bias; and 3) indicating the number of participants missing in the data set.

The majority of articles (42%) were of medium quality (Bogale et al. 2011; Dwivedi and Sogarwal 2008; Govindasamy and Malhotra; 1996; Hogan, Berhanu, and Hailemariam 1999; Mahmood and Ringheim 1996). Generally, these articles could be improved by: 1) enhancing the presentation of odds ratios through the inclusion of both adjusted and unadjusted ratios; and 2) consistently presenting category boundaries when numbers are presented (e.g., age). Interestingly, a majority of these articles (3 of 5) did not provide a balanced title and abstract that summarized the study's purpose, methods, results, and conclusions, which is an additional area for focused improvement.

We ranked three studies as high quality (Corroon et al. 2013; Do and Kurimoto 2012; and Jejeebhoy 2002). While no study met all criteria, the three listed above met most, if not all, the criteria in the methods and discussion sections. That said, none of these studies included a discussion of sensitivity analyses. Generally, the high quality articles included a cautious interpretation of the results and provided a balanced discussion of the findings. Additionally, they provided thorough information on methods and analysis, unlike many of the lower quality studies.

It is important to note that quality assessment is subjective, and the quality measurements expressed here may not fully reflect the merit of these studies. Our quality tool is not exhaustive and is merely a summary of our findings. Overall, no study effectively addressed missing data, sampling framework and potential biases, and sensitivity analyses. Additionally, no geographic

or temporal patterns were apparent in scores for study quality. The three highest-scoring articles (Corroon et al. 2013; Do and Kurimoto 2012; Jejeebhoy 2002) spanned over a decade and represented multiple African countries and India. The four lowest scoring articles (Guntupalli and Nangia 2008; Deb, Kabir, and Kawsar 2011; Ahmed et al. 2010; Hindin 2000) had varied publication dates and represented India, Bangladesh, and a multi-country study.

Outcome Measure

Half of the authors did not specify the contraceptive method used in the analysis, and 50% specified "modern" method use, of which only two (Corroon et al. 2013; Do and Kurimoto 2012) specified the type(s) of "modern" methods included in the study (Table 2). Interestingly, with the exception of the studies by Govindasamy and Malhotra (1996) and Hindin (2000), the studies conducted before 2010 did not include a specification of whether the method(s) studied were "modern" and furthermore, which type(s) of contraceptive methods were studied. Generally, with the exception of Corroon and colleagues (2013), the authors analyzing non-DHS secondary data sources presented a vague, if any, definition of contraception.

In addition to the definition of contraception, current contraceptive use at time of survey was also inconsistently defined and measured. All authors specified current contraceptive use at time of survey as the outcome with the exception of Hindin (2000) and Ahmed and colleagues (2010) who used the phrase "modern contraceptive use", creating uncertainty around when the contraceptive was used. For clarity, the most desirable outcome measure would include information on "modern" method(s) and also clearly indicate current use at time of survey. Only three studies fulfilled this criteria (Corroon et al. 2013; Do and Kurimoto 2012; Govindasamy and Malhotra 1996).

Most authors (75%) measured current contraceptive use at time of survey dichotomously (yes/no). However, two studies (Ahmed et al. 2010; Hindin 2000) lacked a clear definition of the measurement instrument. Bogale and colleagues (2011) used six questions to measure current contraceptive use at time of survey, which were then averaged to produce a mean for analysis. This approach is unique and offers the potential for further exploration.

Exposure Measure

Overall, the authors used an array of exposure measures to assess women's agency. One quarter looked solely at decision making as an expression of women's agency (Bogale et al. 2011; Hindin 2000; Hogan, Berhanu, and Hailemariam 1999); whereas, no one chose to examine solely women's freedom of movement. One third of authors assessed both decision making and freedom of movement (Corroon et al. 2013; Dwivedi and Sogarwal 2008; Govindasamy and Malhotra 1996; Jejeebhoy 2002), and another third presented a unidimensional measure of agency, often incorporating either decision making, freedom of movement, or both (Ahmed et al. 2010; Deb, Kabir, and Kawsar 2011; Guntupalli and Nangia 2008; Mahmood and Ringheim 1996). Only one study (Do and Kurimoto 2012) included an assessment of decision making and freedom of movement separately, along with a unidimensional measure of women's agency. However, Do and Kurimoto's (2012) unidimensional scale was not relevant to the present analysis because the scale included sexual activity negotiation and domestic violence attitudes as agency measures, neither of which are decision making or freedom of movement.

In general, the 12 studies included multiple terms and measures to assess women's agency. Tables 3 and 4 present detailed terminology and measurement[ii]. A third of authors used the term "empowerment" in their papers, while half used the term "autonomy". The remaining two

studies included the terms “domestic decision making power” (Bogale et al. 2011) and “household position” (Govindasamy and Malhotra 1996). Notably, while these two studies (Bogale et al. 2011; Govindasamy and Malhotra 1996) include an assessment of women’s decision making and/or freedom of movement, the authors chose not to use “empowerment” or “autonomy” as descriptors.

Of the authors of studies using the term “women’s empowerment”, 75% operationalized it as decision making. Ahmed and colleagues (2010) also included mobility in this operationalization, and Corroon and colleagues (2013) similarly included partner prohibition (see Table 4). Interestingly, in those studies including the term “women’s autonomy,” 83% of authors also operationalize it as decision making. Dwivedi and Sogarwal (2008), add physical autonomy to this operationalization, and Guntupalli and Nangia (2008) and Jejeebhoy (2002) add freedom of movement (operationalized as mobility) to their operationalization of “autonomy.” Mahmood and Ringheim (1996) operationalize “autonomy” more specifically: as a woman’s ability to travel alone to a health center. Of the remaining studies, Govindasamy and Malhotra (1996) operationalize “household position” as household finances and freedom of movement. Bogale and colleagues (2011) simply operationalize “domestic decision making power” as basic decision making.

This review of common terminology clarifies that authors often use different constructs (e.g., autonomy and empowerment) to describe the same items (e.g., decision making and freedom of movement). Conversely, authors often use the same concept to describe two different items (e.g., agency is solely decision making versus decision making and freedom of movement). These inconsistencies are cause for concern and will be addressed further in the Discussion section.

As with terminology, the authors use varying measurement items to assess agency. Table 3 shows a listing of items used to measure decision making, freedom of movement, and other related indicators. The most commonly used item for decision making was decisions about the woman's own healthcare, which was employed in seven studies (Ahmed et al. 2010; Corroon et al. 2013; Deb, Kabir, and Kawsar 2011; Do and Kurimoto 2012; Dwivedi and Sogarwal 2008, Guntupalli and Nangia 2008; Hogan, Berhanu, and Hailemariam 1999). The second most commonly used item was decisions on large household purchases, which was used in six studies (Ahmed et al. 2010; Corroon et al. 2013; Deb, Kabir, and Kawsar 2011; Hindin 2000; Hogan, Berhanu, and Hailemariam1999; Jejeebhoy 2002). The item regarding decisions about joining a club was used only by Hogan, Berhanu, and Hailemariam (1999), and the item regarding decisions about working outside of the home was only used by Hindin (2000). Decisions on "social, cultural, and family relations" was solely used by Bogale and colleagues (2011) and was poorly defined in the text.

The most common item for freedom of movement was a woman's ability to visit or to receive visits from family, friends, and/or relatives, and eight studies included this item (Ahmed et al. 2010; Corroon et al. 2013; Deb, Kabir, and Kawsar 2011; Do and Kurimoto 2012; Dwivedi and Sogarwal 2008; Govindasamy and Malhotra 1996; Guntupalli and Nangia 2008; Jejeebhoy 2002). The second most commonly used item was a woman's ability to travel to a market and/or community center, and four studies included this item to assess freedom of movement (Dwivedi and Sogarwal 2008; Govindasamy and Malhotra 1996; Guntupalli and Nangia 2008; Jejeebhoy 2002). Corroon, et al. (2013) used three unique freedom of movement items (work outside the home, using a mobile phone, and using contraceptives) as part of the "partner prohibition" latent variable, and Jejeebhoy (2002) used two other items (travel to a community fair and travel to a

neighboring village). Guntupalli and Nangia (2008) used whether a woman has her own money as an item that did not clearly fall into either category.

Identical items were used for both decision making and freedom of movement. For example, Hindin (2000) used work outside the home as a decision making item; whereas Corroon and colleagues (2013) used it as a freedom of movement item. Similarly, three studies (Corroon et al. 2013; Dwivedi and Sogarwal 2008; Guntupalli and Nangia 2008) included visits to family/relatives/friends to measure both decision making and freedom of movement. While the decision making item also includes staying with family/relatives/friends, the two items are almost identical. Finally, with the exception of daily meal preparation and have own money, Dwivedi and Sogarwal (2008) and Guntupalli and Nangia (2008) used all of the same items, which could be indicative of their shared data set (NFHS-2).

The second column in Table 3 presents response categories for the items introduced above. Only two decision making response categories were used in more than one study (wife or both partners have a say; all others [RC3] and primarily husband; both husband and wife; primarily wife; someone else [RC5] [Table 4]). The authors of the three articles that included RC3 (wife or both partners have a say; all others) did not use the same data (Corroon et al. 2013; Do and Kurimoto 2012; Dwivedi and Sogarwal 2008); however, the authors of the two articles that included RC5 (“primarily husband; both husband and wife; primarily wife; someone else”) (Govindasamy and Malhotra 1996; Hogan, Berhanu, and Hailemariam 1999) used DHS data in their analyses. Like the response categories for decision making, only two response categories for freedom of movement were included in more than one article (dichotomous [yes/no] and partner does not prohibit/no permission required, permission required/all others). Of the three articles that included RC1a (dichotomous [yes/no]) (Ahmed et al. 2010; Jejeebhoy 2002;

Mahmood and Ringheim 1996), both Ahmed and colleagues (2010) and Mahmood and Ringheim (1996) used DHS data for their analyses. The authors of the two articles that included RC2a (partner does not prohibit/no permission required; permission required/all others) (Corroon et al. 2013; Dwivedi and Sogarwal 2008) did not use similar data in their analyses.

In seven studies (58%), the authors used the items from Table 3 to create variations of a scale or index comprised of 2 or more items (Table 4). Dwivedi and Sogarwal (2008) and Jejeebhoy (2002) created two summative scales-one for decision making and one for freedom of movement. Bogale and colleagues (2011) created two scales for two decision making measures. Mahmood and Ringheim (1996) created a unidimensional agency scale based on a singular question asking if a woman could travel to a health center unaccompanied (yes/no). The authors of three studies (Ahmed et al. 2010; Deb, Kabir, and Kawsar 2011; Guntupalli and Nangia 2008) created a unidimensional scale using both measures of decision making and freedom of movement. Hogan and colleagues (1999) used principal components analysis to reduce the number of items into orthogonal, linear composite scores, and Corroon and colleagues (2013) used a latent variable factor analysis approach to summarize the measures. Do and Kurimoto (2012) and Hindin (2000) left the measurements as dichotomous and analyzed them separately instead of creating a scale or index. Researchers are often using the same items to create very different instruments. In example, of the seven studies using DM1 (healthcare) as an item, the authors of three studies produced a unidimensional summative scale (Ahmed et al. 2010; Deb, Kabir, and Kawsar 2011; Guntupalli and Nangia 2008), one used principal components analysis (Hogan, Berhanu, and Hailemariam 1999), one used factor analysis (Corroon et al. 2013), one used dichotomous measures (Do and Kurimoto 2012), and one produced two summative scales (Dwivedi and Sogarwal 2008).

Relationship between Women's Agency and Contraceptive Use at Time of Survey

The authors of the majority of studies (50%) found inconsistent relationship(s) between their selected measures of women's agency and current contraceptive use at time of survey (Deb, Kabir, and Kawsar 2011; Dwivedi and Sogarwal 2008; Govindasamy and Malhotra 1996; Guntupalli and Nangia 2008; Hogan, Berhanu, and Hailemariam 1999; Jejeebhoy 2002) (Table 4). Hindin (2000) found no association between decision making, as measured by three DHS questions, and current contraceptive use at time of survey in an analysis controlling for ten items. Do and Kurimoto (2012) found no association between sociocultural decision making and health seeking behavior, as measured by two different scales, and current use of female-only contraceptive methods at time of survey in an analysis controlling for nine individual and community-level variables. It is notable that the study by Do and Kurimoto (2012) is a multicounty study, which could have influenced the outcome. Additionally, both Do and Kurimoto (2012) and Hindin (2000) used data from only African countries.

Of the four studies using a unidimensional measure of empowerment, the authors of two studies found a consistently positive and statistically significant association (Ahmed et al. 2010; Mahmood and Ringheim 1996); whereas, two found inconsistent associations with regional and tribal variation, respectively (Deb, Kabir, and Kawsar 2011; Guntupalli and Nangia 2008). Deb and colleagues (2011) found a significant positive relationship between high empowerment and contraceptive use at time of survey in one of six states surveyed and a marginally significant positive relationship in two of six states surveyed; they found no association in the remaining 50% of states. In Guntupalli and Nangia (2008), the relationship between medium and high autonomy and contraceptive use at time of survey was statistically significant and positive for women in a non-scheduled tribe but not associated for those in a scheduled tribe.

Of those authors using solely decision making as an exposure, one found no association (Hindin 2000), one found a consistently positive association (Bogale et al. 2011) and one found inconsistent relationships with contraceptive use at time of survey (Hogan, Berhanu, and Hailemariam 1999). Hogan and colleagues (1999) found regional variation with a statistically significant positive relationship for rural areas and no association for urban areas. The authors of all three studies included DM6 (Related to children [including fertility]) as one of their items.

The authors of four studies assessed both decision making and freedom of movement (Corroon et al. 2013; Dwivedi and Sogarwal 2008; Govindasamy and Malhotra 1996; Jejeebhoy 1996). Corroon and colleagues (2013) found a significant positive relationship between decision making and contraceptive use at time of survey and a marginally significant relationship between freedom of movement and contraceptive use at time of survey. Interestingly, the authors of the other three studies all found that freedom of movement was both statistically significant and positively associated with contraceptive use at time of survey, but none found the same association for decision making (Dwivedi and Sogarwal 2008; Govindasamy and Malhotra 1996; Jejeebhoy 2002). Of these studies, Dwivedi and Sogarwal (2008) found a negative relationship between decision making and contraceptive use at time of survey, and Govindasamy and Malhotra (1996) found no association between decision making and contraceptive use at time of survey. Additionally, Dwivedi and Sogarwal (2008) assessed the interaction between decision making and freedom of movement and found significance, indicating that decision making and freedom of movement will affect one another when used together in an analysis. These three studies all included FOM 1 (visits to/from family/relative/friends) and FOM 6 (travel to market/community center) as items for freedom of movement, and Jejeebhoy (2002) added FOM

5 (travel to health center) and FOM 7- FOM 8 (travel to community fair; travel to neighboring village).

Internal Review Board Statement

I was not required to submit to IRB as I did not conduct human subject research.

DISCUSSION

Defining Agency

This systematic review sought to understand better the relationship between women's agency as a component of women's empowerment and its impact on "modern" contraceptive use at the time of the survey. We found general inconsistency within studies between decision making and freedom of movement and the outcome, "modern" contraceptive use at time of survey. Our review revealed that these inconsistencies in defining and operationalizing agency are widespread. While the authors of all twelve studies were assessing either decision making, freedom of movement, or both, they used variable language to describe these items. 50% of authors used "autonomy" as a blanket term to describe their measures for agency; whereas, 33% used "empowerment" to describe similar measures. The authors of the remaining two articles used "domestic decision making power" and "household position" (Bogale et al. 2011; Govindasamy and Malhotra 1996). None of the authors used "agency" to describe decision making and/or freedom of movement, a departure from Kabeer's (1999) aforementioned framework of empowerment. By using the terms "autonomy" or "empowerment" to describe influence in decision making and/or freedom of movement, the authors use overarching terminology to describe agency, as opposed to more specific wording. This inconsistency in verbiage leads to confusion about both empowerment and agency's place in the framework.

Interestingly, all of the studies that included the term "empowerment" were published in 2010 or later, perhaps signifying that this term is currently preferred; whereas, "autonomy" has become less common. This evolving terminology presents a challenge to systematic reviews and multi-study analyses, possibly leading to missed articles during the search process and by hampering comparisons of findings across studies.

As Heckert and Fabic (2013) note, the conceptualization of empowerment has changed over timed due to a combination of evolving theory and practical application; the idea that autonomy means "independence rather than interdependence" has led to changing terminology (Heckert and Fabic 2013). In more collectivist cultures, women may find empowerment but not necessarily be completely independent, leading to a change in the definition and application of the word "autonomy". Women's status has also lost footing as a key descriptor for empowerment because it includes established items like education and financial assets, unlike the fluid concept of women's empowerment, which includes change and evolving choices (Heckert and Fabic 2013).

Balancing Consistency and Context Specificity

Measurement and response items were extremely varied (see Table 3), calling attention to a need for consistent yet culturally relevant items, response categories, and instruments. It is important to acknowledge that wording strongly impacts women's responses, and this knowledge must be balanced with cultural relativism. For example, "work outside the home" was used by different authors as an item for decision making in Zimbabwe (Hindin 2000), and as an item for mobility in Nigeria (Corroon et al. 2013). Hindin (2000) used DHS data in the analysis, while Corroon and colleagues (2013) analyzed a non-DHS data set. However, it is important to assess whether

these items were simply used for convenience or for their relevance to the particular cultural context. If the latter is true, we might assume that women in Zimbabwe view work outside the home as a decision, while women in Nigeria view this as an expression of their freedom to move without obstruction.

Certain items related to decision-making and freedom of movement are not appropriate in every culture and/or country. For example, the authors of all studies conducted in India (Dwivedi and Sogarwal 2008; Guntupalli and Nangia 2008; Jejeebhoy, 2002) used DM4 (jewelry purchases) as a decision making item, indicating the importance of jewelry in Indian culture. However, when advocating for consistent measurements in a move toward comparability and generalizability, it is of particular relevance that items, response categories, and measurement instruments may not produce an accurate representation of a woman's agency due to the cultural context. As Kabeer (1999) notes, a woman's choices are drastically molded by the beliefs, values, and practices of her geographical location. Even within a single country, a woman in one region may have different exposures to status indicators (e.g., education), which thereby impacts her development of agency and freedom of choice (Kabeer 1999).

However, certain items could arguably have been included across settings. DM items 1-3 (healthcare, small household purchases, small/daily household needs/purchases [including food]) are fairly universal items, yet the authors of only 7 of 11 studies assessing decision making used DM1. The authors of even fewer studies, 6 of 11, included DM2, and only 5 of 11 included DM3. Items for freedom of movement were particularly inconsistent, and FM items 2-4 (work outside the home, using a mobile phone, using contraceptives) were exclusively used by Corroon and colleagues (2013). However, FM2 (using a mobile phone) is particularly applicable to all studies given that 75% of the world's population now has access to a mobile phone, exceeding

the number of people who have access to adequate sanitation (The World Bank Group 2012; United Nations 2013). By improving consistency among these items while simultaneously maintaining cultural competency, the academic community can produce increasingly comparable and generalizable results.

Agency and Contraceptive Use at Time of Survey

Generally, the relationship between agency and contraceptive use at time of survey varied across studies. The wide variation between regions and measures is concerning. These inconsistencies could be due to methodological differences in variable construct, true differences in the relationship between agency subdomains and contraceptive use at time of survey, or to differences in the selected associations across national or subnational contexts. As the first possibility has already been discussed, it is imperative to examine actual differences in contraceptive use at time of survey, and their link to women's agency. Overall, the authors of 50% of studies found inconsistent associations between either decision making or freedom of movement and contraceptive use at time of survey. Yet, the authors of only 33% of studies found positive relationships throughout, regardless of exposure measure (decision making or freedom of movement) and/or region/subgroup (Ahmed et al. 2010; Bogale et al. 2011; Corroon et al. 2013; Mahmood and Ringheim 1996). While no apparent patterns emerged among the four consistently positive studies, the authors of six studies with inconsistent associations present a strong relationship between freedom of movement and contraceptive use at time of survey.

Of these studies, four included an independent freedom of movement component, and the authors of these four studies found significant, positive relationships between freedom of movement and contraceptive use at time of survey (Dwivedi and Sogarwal 2008; Govindasamy

and Malhotra 1996; Jejeebhoy 2002; Mahmood and Ringheim 1996). The authors of these same studies found either no association between decision making and contraceptive use at time of survey (Govindasamy and Malhotra 1996; Jejeebhoy 2002), a negative association (Dwivedi and Sogarwal 2008), or did not assess decision making as an exposure (Mahmood and Ringheim 1996). Interestingly, 75% of these studies are from South Asia, and the other is from the Middle East/North Africa region (Govindasamy and Malhotra 1996). As Kabeer (1999) points out, oppressive family members, in particular mothers-in-law, are a more widespread problem in South Asia than throughout Africa. Therefore, freedom of movement is particularly pivotal in these areas of the world and potentially has far greater potential for encouraging contraceptive use than other facets of empowerment.

In contrast to freedom of movement, decision making is perhaps not as indicative of women's agency in historically male-dominated domains. Typical items used to measure decision making include questions related to daily meal preparation, small household purchases, etc., and it is imperative to assess whether these decisions are strategic life choices as opposed to simple and inconsequential selections (Kabeer 1999). Given that these decisions often are relegated to women, the relationship between women's "achievements" and the ability to make these decisions is unclear. Not surprisingly, the authors of only one study looking at both decision making and mobility separately, (Corroon et al. 2013), found a stronger association between decision making and contraceptive use at time of survey than freedom of movement; yet, this difference in significance was marginal. Likewise, the authors that found no association between any measure of agency and contraceptive use at time of survey both assessed decision making in their analyses (Do and Kurimoto 2012; Hindin 2000).

Finally, the acceptability of contraceptive use and availability of contraceptives varies widely by country and even region. While some countries have a strong history of state-run family planning programs, others offer little to no support for contraceptive access and uptake. For example, India has been a proponent of family planning programs since the 1960s and contraceptive use is not only encouraged but rewarded (Satia and Maru 1986). However, in countries like Egypt, family planning programs must constantly contend with religious fundamentalism, which is reflected in both women and men's behavior surrounding contraceptive uptake (Longworthy and Fierman 1988). Therefore, it is important to consider the country context and a woman's current access to contraception, regardless of agency. As Kabeer (1999) acknowledges, in countries with robust family planning programs, accessing and using contraception does not necessarily "require any great assertiveness" or expression of agency.

Limitations, Generalizability, and Policy Implications

This systematic review was limited by its scope and inclusion/exclusion criteria. If we could have included a larger sample size, outcomes may have been more consistent across studies, including items and instruments, or the larger sample size may have further strengthened our findings of inconsistency. Additionally, half of the included analyses were based on DHS surveys, which limited the variety among studies, including their items and response categories. Interestingly, the authors of both studies finding "no association" used DHS data from African countries (Do and Kurimoto 2012; Hindin 2000). Of the authors of the other four studies using DHS data, two found positive associations (Ahmed et al. 2010; Mahmood and Ringheim 1996), while the other two found inconsistent relationships (Deb, Kabir, and Kawsar et al. 2011; Govindasamy and Malhotra 1996).

DHS surveys have been criticized for their limited measurement of empowerment, and Heckert and Fabic (2013) suggest the addition of multiple questions in the area of decision making, and two-thirds of the suggested additions refer to contraceptive use. The addition of these questions may make DHS data sounder for measuring women's empowerment. Additionally, we considered a study which included an intriguing analysis of women's agency and contraceptive use, but the outcome measure was ever use at time of survey as opposed to current use at time of survey (Woldemicael 2009). Finally, all included studies in this review were based on cross sectional data, which limits our ability to assess temporal ordering.

Most studies included in this review were from lower-middle income countries (50%). This geographic distribution suggests that the results may not be generalizable to other poorer settings. Also, except for the study by Jejeebhoy (2002), the authors of both studies from India (Dwivedi and Sogarwal 2008; Guntupalli and Nangia 2008) used the same data set (NFHS-2) and all of the same decision making and freedom of movement items, with the exception of two items. These similarities lead to concerns over these studies' global applicability and relevance to India's most marginalized populations that are often missed by large, national surveys. Assessing external validity is difficult, and the issues discussed above pose problems for making policy recommendations and creating targeted programs (Ahmad et al. 2010).

Recommendations

Despite these limitations, recommendations may be warranted based on the findings presented here. This systematic review has shown that, women's agency is inconsistently associated with current contraceptive use, leading to questions around both measurement and the cultural relevance of agency measures. For future studies, it is recommended that authors use only survey

questions (DHS or otherwise) that are culturally appropriate and relevant to the country being studied, in order to produce associations truly reflective of the study population. As Heckert and Fabic (2013) point out, researchers should "carefully consider the cultural context" of their study during the creation of measurement instruments, data collection, and data analysis.

We also suggest a move toward longitudinal, as opposed to cross-sectional, data collection. This shift facilitates the teasing out of temporal ordering and helps to provide more than just a snapshot picture of women's agency and its effect on contraceptive use. We also note that only 33% of studies were from low income countries, indicating that more research is needed among this country classification when assessing agency and current contraceptive use. Also, we found a significant dearth of research in Latin America, Southeast Asia, and the Levant region of the Middle East when searching for studies on agency and current contraceptive use. Therefore, it is recommended that more research is conducted in these geographic areas around agency and its impact on key reproductive health outcomes, particularly current contraceptive use.

Lastly, we strongly recommend that researchers come to a consensus around measures for agency, including question and response items, along with scales. A consistent definition and way to measure agency would improve both generalizability and reproducibility. More research is needed to determine the true effect of both decision making and freedom of movement on current contraceptive use. This research should be undertaken via use of a standardized measurement instrument and culturally appropriate items.

Although the relationship between agency and current contraceptive use was overwhelmingly inconsistent, freedom of movement was most frequently positively associated with the outcome. Therefore, it is recommended that public health programs integrate women's empowerment

programs when seeking to increase contraceptive use with a particular focus on freedom of movement, the definition of which will vary by location and study population. While inputs like education and financial resources are important preconditions for women's agency and freedom of choice (Kabeer 1999), actual enhanced agency is often the stepping stone to outcome attainment.

CONCLUSION

This study assessed the relationship between women's agency, expressed as decision making and freedom of movement, and women's use of a "modern" contraceptive method at time of survey. Our systematic review of the literature generally revealed inconsistent relationships between this exposure and outcome, with a stronger positive relationship for freedom of movement among the positive associations. While these results challenge the current approach to conceptualizing empowerment, they are also encouraging. The majority of studies (83%) found at least one positive association, which speaks to the impact of women's agency on current contraceptive use. These findings have broad implications for policy and future research. It is clear that by empowering women, particularly through an increase in their freedom of movement, there is potential to increase contraceptive uptake and adherence. These results also encourage family planning programs to consider women's agency, within the country context, as a key foundational component of outreach. For future research, we recommend a consensus in the academic community around empowerment, including its definition, application and operationalization. By using a standardized approach, researchers and policy makers can better assess the effect of empowerment, and particularly agency, on reproductive health outcomes.

APPENDIX

FIGURE 1: Components of women's empowerment (Kabeer 1999)

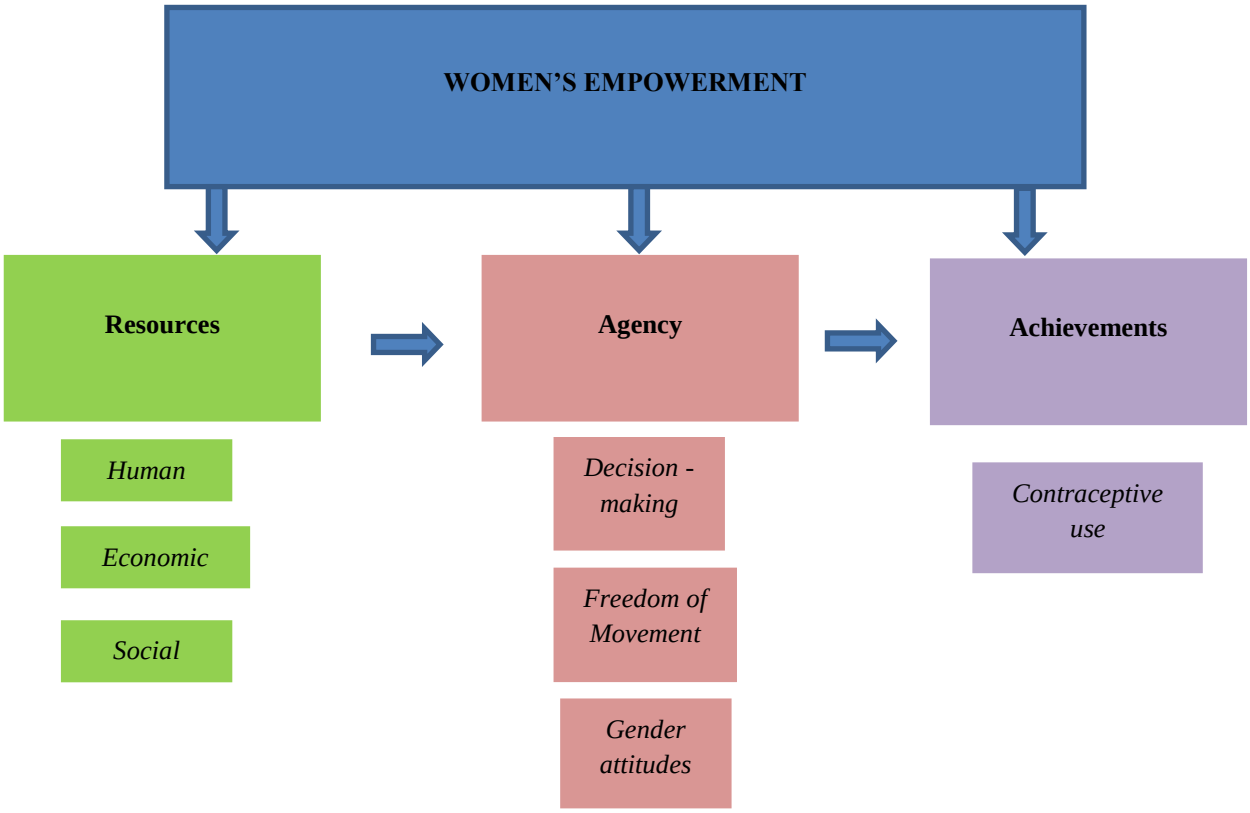


FIGURE 2: Search terms for identifying the effect of women's empowerment on current contraceptive use

Exposures		**Outcomes**
"Women's Agency" **OR**	***AND***	Contraception
"Women's Empowerment" **OR**		Contraceptives
"Women's Autonomy" **OR**		Birth control pills
"Women's Decision making" **OR**		Oral contraceptives
"Women's Mobility" **OR**		IUD
"Women's Freedom of Movement" **OR**		Withdrawal
		Sterilization
"Women's Status" **OR**		
"Gender Equality"		
	NOT	Abortion
		HIV

FIGURE 3: Modern contraceptive methods (World Health Organization 2013)

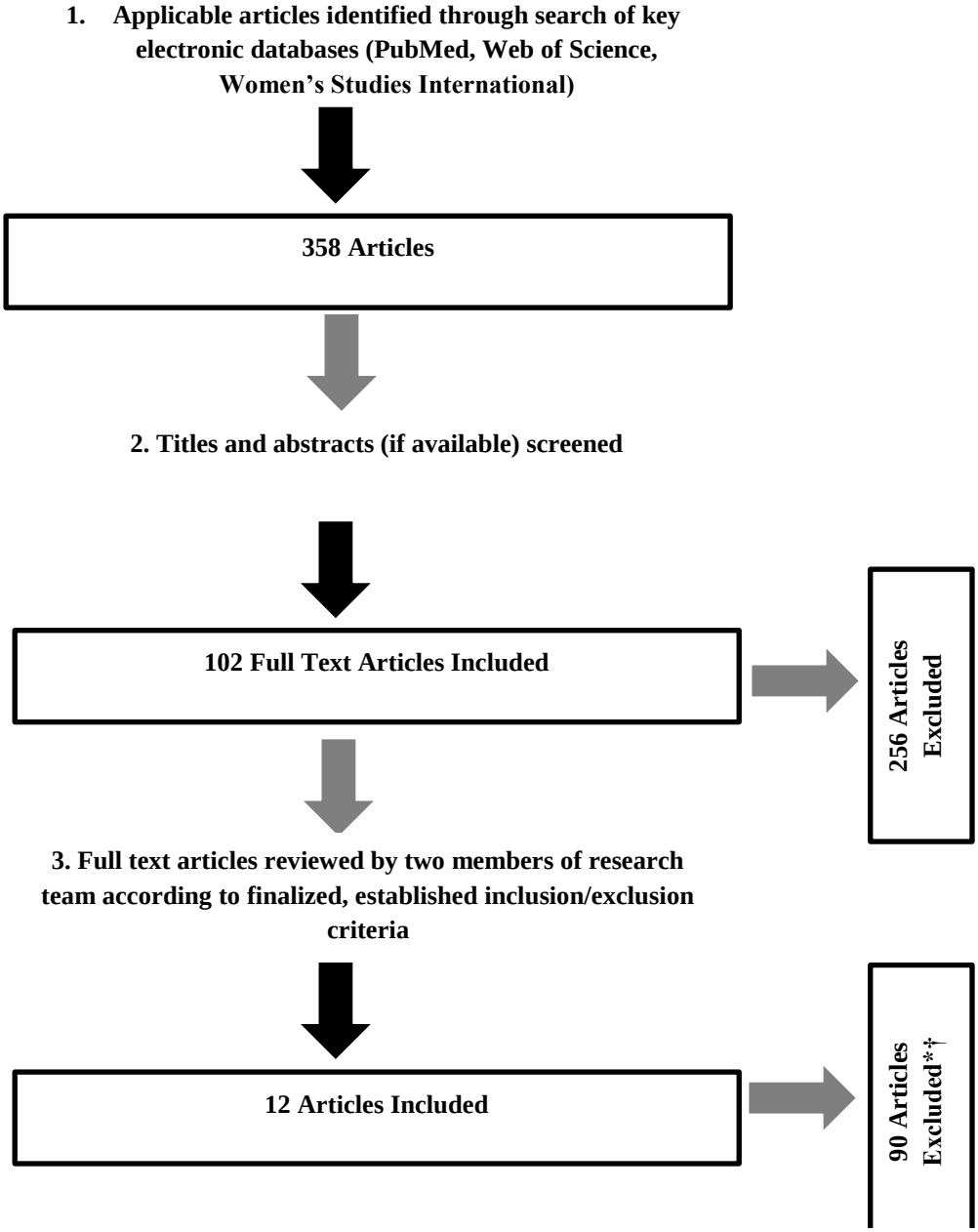
Method		**Type**
Oral contraceptives		Combined, progestogen-only
Implants		
Progestogen-only injectables		
Injectables		Monthly, combined injectable contraceptives
Intrauterine Device		Copper containing, levonorgestrel
Condoms		Female, male with other methods
Sterilization		Female, male
Emergency contraception		
Withdrawal		
	NOT	Lactational amenorrhea
		Fertility awareness
		Solely male condoms

TABLE 1: Final inclusion/exclusion criteria

Criterion	*Included*	*Excluded*	*Rationale*
Year	January 1980-September 2013	1979 and below	Family planning research was at its height in the 1980s, eroded in the 1990s and has recently experienced a resurgence (Cleland 2006).
Language	English and Spanish	All other languages	Key reviewer speaks only English and Spanish.
Peer Reviewed	Peer reviewed	Non peer reviewed	Peer reviewed articles will help to exclude gray literature and ensure high quality, comparable research.
Age	15-49	Below 15 or over 49	Ensures consistency with the Demographic and Health Survey, which restricts age to the reproductive years of 15-49 (USAID 2013).
Geographic Area	Low income, lower-middle income, upper-middle income (The World Bank Group 2014)	High income	The bulk of studies occur in low, lower-middle, or upper-middle income countries, and high income countries face much different health challenges and outcomes.
Study Type	Quantitative or mixed methods with a stand-alone quantitative portion	Qualitative or mixed methods without a stand-alone quantitative portion	This will ensure comparability of findings across studies.
Contraceptive Methods	Modern (including emergency contraception, sterilization, and withdrawal), vague (World Health Organization 2013)	Traditional, non-modern, only condoms	Modern methods are defined by the WHO, and continuity in methods allows for better comparison across articles. Additionally, condoms are not included as a stand-alone method due to their relationship with HIV-focused studies. Withdrawal is included because some women use it as an expression of empowerment

			(Sirkeci and Cindoglu 2012)
Sampling	Population based	Not population based (including clinic based)	This allows for better comparison across articles and reduces bias.
Exposure Measure	Agency	Not agency	Agency may include either mobility or decision making (see Figure 1).
Outcome Measure	Current contraceptive use	Nonuse, past use, ever use	This review seeks to assess empowerment's impact on current contraceptive use. Additionally, women who are currently using contraception will better recall their method as opposed to past or ever users.
Analysis	Multivariate minimum	Less than multivariate	Multivariate generally accounts for confounders and will allow for better continuity in the analysis and comparison.

FIGURE 4: Flow diagram of article inclusion/exclusion process



*Four articles initially included (n=16) were excluded during data extraction upon discovery that articles did not meet inclusion/exclusion criteria.

TABLE 2: Characteristics of included studies (n=12)

Characteristic	*Number of Studies*	*Percentage of Studies**	*Author and Date*
Year Published			
1991-2000	4	33	Govindasamy and Malhotra (1996), Hindin (2000), Hogan, Berhanu, and Hailemariam (1999), Mahmood and Ringheim (1996)
2001-September 2013	8	67	Ahmed, et al. (2010), Bogale, et al. (2011), Corroon, et al. (2013), Deb, Kabir, and Kawsar (2011), Do and Kurimoto (2012), Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008), Jejeebhoy (2002)
World Bank Classification			
Low income: Ethiopia, Bangladesh, Zimbabwe	4	33	Bogale, et al. (2011), Deb, Kabir, and Kawsar (2011), Hindin (2000), Hogan, Berhanu, and Hailemariam (1999)
Lower-middle income: Nigeria, India, Egypt, Pakistan	6	50	Corroon, et al. (2013), Dwivedi and Sogarwal (2008), Govindasamy and Malhotra (1996), Guntupalli and Nangia (2008), Jejeebhoy (2002), Mahmood and Ringheim (1996)
Multi-country analyses using 2+ country categories	2	17	Ahmed, et al. (2010), Do and Kurimoto (2012)
Region			
Sub Saharan Africa	4	33	Bogale, et al. (2011), Corroon, et al. (2013), Hindin (2000), Hogan, Berhanu, and Hailemariam (1999)
Middle East and North Africa	1	8	Govindasamy and Malhotra (1996)
South Asia	5	42	Deb, Kabir, and Kawsar (2011), Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008), Jejeebhoy (2002), Mahmood and Ringheim (1996)
Multi country	2	17	Ahmed, et al. (2010), Do and Kurimoto (2012)
Data Source			
Demographic and Health Surveys (DHS)	6	50	Ahmed, et al. (2010), Deb, Kabir, and Kawsar (2011), Do and Kurimoto (2012), Govindasamy and Malhotra (1996), Hindin (2000), Mahmood

			and Ringheim (1996)
Other Secondary	5	42	Corroon, et al. (2013), Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008), Hogan, Berhanu, and Hailemariam (1999), Jejeebhoy (2002)
Primary	1	8	Bogale, et al. (2011)
Sample Size			
Under 1,000	1	8	Bogale, et al. (2011)
1,001-10,000	6	50	Corroon, et al. (2013), Govindasamy and Malhotra (1996), Hindin (2000), Hogan, Berhanu, and Hailemariam (1999), Jejeebhoy (2002), Mahmood and Ringheim (1996)
10,001-20,000	1	8	Deb, Kabir, and Kawsar (2011)
20,001+	2	17	Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008)
Multi-country	2	17	Ahmed, et al. (2010), Do and Kurimoto (2012)
Contraceptive Method(s)			
General "Modern"	4	33	Ahmed, et al. (2010), Bogale, et al. (2011), Govindasamy and Malhotra (1996), Hindin (2000)
Specified "Modern"	2	17	Corroon, et al. (2013), Do and Kurimoto (2012)
Vague/Unknown	6	50	Deb, Kabir, and Kawsar (2011), Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008), Hogan, Berhanu, and Hailemariam (1999), Jejeebhoy (2002), Mahmood and Ringheim (1996)
Agency Measure			
Decision making only	3	25	Bogale, et al. (2011), Hindin (2000), Hogan, Berhanu, and Hailemariam (1999)
Unidimensional only	4	33	Ahmed, et al. (2010), Deb, Kabir, and Kawsar (2011), Guntupalli and Nangia (2008), Mahmood and Ringheim (1996)
Decision making and freedom of movement	4	33	Corroon, et al. (2013), Dwivedi and Sogarwal (2008), Govindasamy and Malhotra (1996), Jejeebhoy (2002)
Decision making, freedom of movement, and combined	1	8	Do and Kurimoto (2012)**

unidimensional			
Theoretical Framework			
General	1	8	Ahmed, et al. (2010)
Empowerment only	1	8	Jejeebhoy (2002)
Contraceptive use only	2	17	Bogale, et al. (2011), Hogan, Berhanu, and Hailemariam (1999)
Empowerment and contraceptive use	4	33	Do and Kurimoto (2012), Govindasamy and Malhotra (1996), Hindin (2000), Mahmood and Ringheim (1996)
No framework	4	33	Corroon, et al. (2013), Deb, Kabir, and Kawsar (2011), Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008)
Type of analysis			
Multivariate logistic regression	7	58	Bogale, et al. (2011), Deb, Kabir, and Kawsar (2011), Dwivedi and Sogarwal (2008), Guntupalli and Nangia (2008), Hogan, Berhanu, and Hailemariam (1999), Jejeebhoy (2002), Mahmood and Ringheim (1996)
Multivariate logistic regression and another multivariate/advanced model	3	25	Ahmed, et al. (2010), Corroon, et al. (2013), Hindin (2000)†
Multivariate multinomial regression	2	17	Do and Kurimoto (2012), Govindasamy and Malhotra (1996)
Confounders Addressed in Text			
Yes	8	67	Ahmed, et al. (2010), Corroon, et al. (2013), Do and Kurimoto (2012), Dwivedi and Sogarwal (2008), Govindasamy and Malhotra (1996), Hindin (2000), Hogan, Berhanu, and Hailemariam (1999), Jejeebhoy (2002),
No	4	33	Bogale, et al. (2011), Deb, Kabir, and Kawsar (2011), Guntupalli and Nangia (2008), Mahmood and Ringheim (1996)
(Adjusted) Association between measure of agency and current contraceptive use.			

Consistently Positive relationship(s)	4	33	Ahmed, et al. (2010), Bogale, et al. (2011), Corroon, et al. (2013), Mahmood and Ringheim (1996)
Inconsistent relationship(s)	6	50	Deb, Kabir, and Kawsar (2011), Dwivedi and Sogarwal (2008), Govindasamy and Malhotra (1996), Guntupalli and Nangia (2008), Hogan, Berhanu, and Hailemariam (1999), Jejeebhoy (2002)
No association	2	17	Do and Kurimoto (2012), Hindin (2000)

*Due to rounding, percentages may not add up to 100.

** NOTE: Combined unidimensional includes measurements not relevant to this analysis and will not be included in Table 4

† NOTE: For our analysis, only the results from the regression were included.

TABLE 3: Agency measurement and response categories*

Measurement Items	Response Categories
Decision making	
DM1. Healthcare	RC1. Dichotomous (yes/no)
DM2. Large household purchases	RC2. 0-2 values not specified
DM3. Small/daily household needs/purchases (including food)	RC3. Wife or both partners have a say; all others
DM4. Jewelry purchases	RC4. Respondent alone; respondent and husband/partner; respondent and other person; husband/partner alone; someone else; other
DM5. Daily meal preparation	RC5. Primarily husband; both husband and wife; primarily wife; someone else
DM6. Related to children (including fertility)	RC6. Alone; jointly with others; only others
DM7. General economic/how to spend money	RC7. Wife has some say; wife has no say
DM8. Social, cultural, and family relations	RC8. Involved in decision (yes/no); major say (yes/no)
DM9. Visits to or staying with family/relatives/friends	
DM10. Joining a club	
DM11. Work outside the home	
Freedom of Movement	
FM1. Visits to/from family/relative/friends	RC1a. Dichotomous (yes/no)
FM2. Work outside the home	RC2a. Partner does not prohibit/no permission required; permission required/all others
FM3. Using a mobile phone	RC3a. Respondent alone; respondent and husband/partner; respondent and other person; husband/partner alone; someone else; other
FM4. Using contraceptives	RC4a. No; alone; with children; with husband; with relative; other
FM5. Travel to health center	RC5a. Wife or both partners have a say; all others
FM6. Travel to market/community center	RC6a. Can go out (yes/no); frequency (vague); accompanied by whom (vague)

FM7. Travel to community fair	RC7a. Permission not required; required; not allowed to go
FM8. Travel to neighboring village	
Other	
O1. Have own money	RC1b. Dichotomous (yes/no)

*Measurement items and response categories have been summarized from their original wording for comparability and brevity.

TABLE 4: The associations between women's agency and current contraceptive use (n=12)

Article	*Agency Terminology*	*Agency Definition*	*Measurement Item(s)*	*Response Categories*	*Measurement Instrument*	*Adjusted Odds Ratio(s)*
Ahmed, et al. (2010)	Empowerment	Decision making and mobility	DM 1-3, 5 FM 1	RC 1 RC 1a	Unidimensional summative scale 0 (low) to 5 (high)	Highest decision making power: 1.82* REF: No decision making power
Bogale, et al. (2011)	Domestic decision making power	Decision making	DM 6-8	RC 2	Two summative scales	Better involvement Measure 1 (rural): 23.3* Better involvement Measure 1 (urban): 3.0* Better involvement Measure 2 (urban): 2.1* REF: Low involvement
Corroon, et al. (2013)	Empowerment	Decision making and partner prohibition‡	DM 1-3, 9 FM 1-4	RC 3 RC 2a	Factor analysis and two latent variables	DM: 1.21*** FM: 1.06+
Deb, Kabir, and Kawsar (2011)	Empowerment	Decision making and mobility	DM: 1-3, 6-7 FM: 1, 5	RC 4 RC 3a-4a	Unidimensional summative scale 0 (low) to 7 (high)	High empowered: Barisal: 0.82 Chittagong: 0.98 Dhaka: 1.15+ Khulna: 1.49** Rajshahi: 1.16+ Sylhet: 1.16 REF: Low empowered
Do and Kurimoto (2012)	Empowerment	Sociocultural and health seeking	DM: 1 FM: 1	RC 3 RC 5a	Dichotomous (0/1)	DM (Joint/woman alone): Namibia: 1.15 Ghana: 1.17

		behavior				Uganda: 1.11 Zambia: 1.01 FM (Joint/woman alone): Namibia: 1.15 Ghana: 1.00 Uganda: 1.07 Zambia: 1.21+ REF: Others/partner alone
Dwivedi and Sogarwal (2008)	Autonomy	Decision making and physical autonomy	DM: 1, 4-5, 9 FM: 1, 6	RC 3 RC 2a	Two summative scales	DM: 0.93* FM: 1.43** Interaction: FM*DM: 0.93**
Govindasamy and Malhotra (1996)	Household Position	Household finances and freedom of movement	DM: 7 FM: 1, 6	RC 5 RC 6a	FM: Summative scale using continuous index variable (1-12) DM: Dichotomous (0/1)	DM (primarily wife): 1.02 FM: 1.08*** REF: Husband/others
Guntupalli and Nangia (2008)	Autonomy	Decision making and mobility	DM: 1, 4, 9 FM: 1, 6 Other: 1	RC 6 RC 7a RC 1b	Unidimensional index ranging from 5 (low) to 16 (high)	Scheduled Tribe: Medium autonomy: 0.97 High autonomy: 0.89 Non Scheduled Tribe: Medium autonomy: 1.21*** High autonomy: 1.28*** REF: Low autonomy
Hindin (2000)	Autonomy	Decision making	DM: 2, 6, 11	RC 7	Dichotomous (0/1)	DM: 0.81

Hogan, Berhanu, and Hailemariam (1999)	Autonomy	Domestic decision making	DM: 1-3, 6, 10	RC 5	Principal components analysis	Rural: 1.36* Urban: 0.89
Jejeebhoy (2002)	Autonomy	Decision making and mobility	DM: 2-4 FM: 1, 5-8	RC 8 RC 1a	Two summative scales	DM: 0.99 FM: 1.07*
Mahmood and Ringheim (1996)	Autonomy	Travel to health center alone	FM: 5	RC 1a	Unidimensional and dichotomous (0/1)	*Can go alone: 1.42*** REF: Accompanied

NOTE for all studies: +p≤0.10, *p≤0.05, **p≤0.01, ***p≤0.001; REF=reference category
*This adjusted odds ratio was converted from a beta coefficient for comparability.

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[i] Of the original n=16, 4 articles were discovered not to meet the established inclusion/exclusion criteria during data extraction, and were removed.

[ii] Measurement items and response categories have been summarized from their original wording for comparability and brevity.

Chapter 4: Conclusion and Recommendations

4.1 Overall Conclusions

This study assessed the relationship between women's agency, expressed as decision making and freedom of movement, and women's use of a "modern" contraceptive method at time of survey. Our systematic review of the literature generally revealed inconsistent relationships between this exposure and outcome, with a stronger positive relationship for freedom of movement among the positive associations. While these results challenge the current approach to conceptualizing empowerment, they are also encouraging. The majority of studies (83%) found at least one positive association, which speaks to the impact of women's agency on current contraceptive use. These findings have broad implications for policy and future research. It is clear that by empowering women, particularly through an increase in their freedom of movement, there is potential to increase contraceptive uptake and adherence. These results also encourage family planning programs to consider women's agency, within the country context, as a key foundational component of outreach. For future research, we recommend a consensus in the academic community around empowerment, including its definition, application and operationalization. By using a standardized approach, researchers and policy makers can better assess the effect of empowerment, and particularly agency, on reproductive health outcomes.

More specifically, our review revealed widespread inconsistencies in defining and operationalizing agency are widespread. While the authors of all twelve studies were assessing either decision making, freedom of movement, or both, they used variable language to describe these items. 50% of authors used "autonomy" as a blanket term to describe their measures for agency; whereas, 33% used "empowerment" to describe similar measures. Other terms included

"domestic decision making power" and "household position". Although this review sought to assess agency, none of the authors used "agency" to describe decision making and/or freedom of movement, a departure from Kabeer's (1999) aforementioned framework of empowerment. By using the terms "autonomy" or "empowerment" to describe influence in decision making and/or freedom of movement, the authors use overarching terminology to describe agency, as opposed to more specific wording. This inconsistency in verbiage leads to confusion about both empowerment and agency's place in the framework.

Generally, the relationship between agency and contraceptive use at time of survey varied across studies. The wide variation between regions and measures is concerning. These inconsistencies could be due to methodological differences in variable construct, true differences in the relationship between agency subdomains and contraceptive use at time of survey, or to differences in the selected associations across national or subnational contexts. Overall, the authors of 50% of studies found inconsistent associations between either decision making or freedom of movement and contraceptive use at time of survey. Yet, the authors of only 33% of studies found positive relationships throughout, regardless of exposure measure (decision making or freedom of movement) and/or region/subgroup. While no apparent patterns emerged among the four consistently positive studies, the authors of six studies with inconsistent associations present a strong relationship between freedom of movement and contraceptive use at time of survey.

In contrast to freedom of movement, decision making as measured in this review is perhaps not as indicative of women's agency in historically male-dominated domains. Typical items used to measure decision making include questions related to daily meal preparation, small household purchases, etc., and it is imperative to assess whether these decisions are strategic life choices as

opposed to simple and inconsequential selections (Kabeer 1999). Given that these decisions often are relegated to women, the relationship between women's "achievements" and the ability to make these decisions is unclear.

4.2 Public Health and Policy Implications

The inconsistent definition and operationalization of women's empowerment has implications for both research and programming. As Heckert and Fabic (2013) note, the conceptualization of empowerment has changed over timed due to a combination of evolving theory and practical application; the idea that autonomy means "independence rather than interdependence" has led to changing terminology (Heckert and Fabic 2013). In more collectivist cultures, women may feel empowered but not necessarily be completely independent by definition of the word, leading to a change in the definition and application of the word "autonomy". The concept of independence versus interdependence must be carefully considered when implementing public health programs, as many women may not actively seek or desire "independence" as it is recognized in high income and OECD countries.

As mentioned above, freedom of movement was particularly significant in South Asian and Middle Eastern/North African contexts. As Kabeer (1999) points out, oppressive family members, in particular mothers-in-law, are a more widespread problem in South Asia than throughout Africa. Therefore, freedom of movement is particularly pivotal in these areas of the world and potentially has far greater potential for encouraging contraceptive use than other facets of empowerment. With that said, public health programs and applicable policies in South Asia, the Middle East, and North Africa must carefully consider the weight of women's freedom of

movement. In order to successfully reach the female population in these regions, it is important to recognize women's restricted ability to move freely and how this restriction may impact their utilization of health services, especially reproductive healthcare.

Conversely, women's decision making may not be as indicative as previously assumed of a woman's true agency. Often, decisions measured by surveys (e.g., DHS) are inconsequential and have little, if any, impact on a woman's actual development of agency. Therefore, public health programs, and particularly research, should pay heed to the actual relevance of a woman's decision making ability, taking the cultural context into account.

Finally, it is imperative to note that the acceptability of contraceptive use and availability of contraceptives varies widely by country and even region. While some countries have a strong history of state-run family planning programs, others offer little to no support for contraceptive access and uptake. For example, India has been a proponent of family planning programs since the 1960s and contraceptive use is not only encouraged but rewarded (Satia and Maru 1986). However, in countries like Egypt, family planning programs must constantly contend with religious fundamentalism, which is reflected in both women and men's behavior surrounding contraceptive uptake (Longworthy and Fierman 1988). Therefore, it is important to consider the country context and a woman's current access to contraception, regardless of agency, when planning public health programs and/or implementing policies related to family planning.

4.3 Recommendations

First and foremost, we recommend consistent, yet culturally appropriate items to measure women's agency. As Kabeer (1999) notes, a woman's choices are drastically molded by the

beliefs, values, and practices of her geographical location. Even within a single country, a woman in one region may have different exposures to status indicators (e.g., education), which thereby impacts her development of agency and freedom of choice (Kabeer 1999).

However, certain items could arguably be included across settings like healthcare decisions, small household purchases, and daily household purchases (e.g., food). In reference to freedom of movement, items like using a mobile phone are particularly applicable across contexts given that 75% of the world's population now has access to a mobile phone, exceeding the number of people who have access to adequate sanitation (The World Bank Group 2012; United Nations 2013). By improving consistency among these items while simultaneously maintaining cultural competency, the academic community can produce increasingly comparable and generalizable results.

Furthermore, it is recommended that DHS surveys be carefully considered for use in future research related to women's empowerment. DHS surveys have been criticized for their limited measurement of empowerment, and Heckert and Fabic (2013) suggest the addition of multiple questions in the area of decision making, and two-thirds of the suggested additions refer to contraceptive use. The addition of these questions may make DHS data sounder for measuring women's empowerment.

Additionally, most studies included in this review were from lower-middle income countries (50%), but only 33% of studies were from low income countries as defined by The World Bank Group (2014). More research is needed among this country classification when assessing agency and current contraceptive use. Also, there is a significant dearth of research in Latin America, Southeast Asia, and the Levant region of the Middle East, so it is recommended that more

research is conducted in these geographic areas around agency and its impact on key reproductive health outcomes, particularly current contraceptive use.

Finally, a move toward longitudinal, as opposed to cross-sectional, data collection would be beneficial to both the research community and for public health programming. This shift facilitates the teasing out of temporal ordering and helps to provide more than just a snapshot picture of women's agency and its effect on contraceptive use. By providing a better understanding of this relationship, we can cater our programs to the exact intervention point in a woman's development of agency.

Overall, it is recommended that public health programs integrate women's empowerment programs when seeking to increase contraceptive use with a particular focus on freedom of movement, the definition of which will vary by location and study population. While inputs like education and financial resources are important preconditions for women's agency and freedom of choice (Kabeer 1999), actual enhanced agency is often the stepping stone to outcome attainment.

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List of Tables and Figures (Chapter 3: Manuscript)

Figures

Tables

Appendix

A. Data Extraction Form

Article Name	**Year (published)**	
Author(s)		
Journal/Source		
Country/Countries		
World Bank country classification	☐ Low income ☐ Lower-middle income ☐ Upper-middle income	
Organization responsible		
Year(s) study took place		
Data source	Primary data collection ☐ / DHS ☐/ Other secondary (*if yes, specify*) ☐	
Study type	Quantitative ☐ / Mixed Methods ☐	
Objective/Research questions		
STUDY DESIGN		
Metrics for empowerment		
Metrics for contraceptive use		
Type(s) of contraception	Type of contraceptive(s) vague? Yes ☐ No ☐	
Other variables assessed		
Inclusion criteria		
Exclusion criteria		
Other outcomes assessed		

Confounders	Mentioned in text? Yes ☐ No ☐
Theoretical framework	There is an explicitly stated or implicitly identified theoretical framework or frame of reference? No ☐ / Yes (*explain*) ☐
STUDY CHARACTERISTICS	
Sample size	
Sample population	
Sample design	Randomized ☐ / Recruited ☐ / Other (*specify*) ☐
Recruitment method	
Setting	Rural ☐ / Urban ☐ / Rural & Urban ☐ Other *(specify)*☐
Location of study	
Dates of Recruitment	
Data Collection methods	
Length of study	
Funding	
More than one study group? (specify)	
Primary study aims	
Additional study aims	

CHARACTERISTICS OF STUDY PARTICIPANTS			
Overall comments			
Sample size			
Age			
Mean			
Median			
Descriptive			

characteristics (ethnicity, gender, etc.)			

STATISTICAL APPENDIX		
Independent variable		
Dependent variable(s)		
Explanatory variable(s)		
Associations Assessed (list)		
Multivariate Ratios for exposure/outcome of interest	Explanation	
	Model 1	
	Model 2	
	Model 3	
	Model 4	
	Additional Models	
Multivariate Ratios for exposure/outcome (if more than one outcome)	Explanation	
	Model 1	
	Model 2	
	Model 3	
	Model 4	
	Additional Models	
Additional outcomes assessed		

CONCLUSIONS	
Identified limitations	
Recommendations	
Conclusions	