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Why Do Women Not Use Preconception Care? A Systematic Review On Barriers And Facilitators

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Importance: Preconception care (PCC) has the potential to optimize pregnancy outcomes. However, awareness of PCC among the target population is generally limited, and the use of PCC remains low.

Importance: The objective of this study was to review the literature on women's perceptions regarding barriers and facilitators for the use of PCC.

Evidence Acquisition: A systematic search was conducted in MEDLINE, Embase, CINAHL, and PsycINFO for published studies until February 2015. Original qualitative and quantitative peer-reviewed studies from Western countries in English, holding women's perceptions regarding barriers and facilitators for the use of PCC. Data extraction and analysis were performed using NVivo version 10 software. A coding frame was derived from the findings and applied by 2 authors. Thematic analysis was used to identify key topics and themes.

Results: Twenty-one good-quality articles were included, of which 10 qualitative and 11 quantitative studies.

Seven main themes were identified: preconditions, emotions and beliefs, perceived need, knowledge and experience, social structure, accessibility, and provider characteristics. “Not (fully) planning pregnancy”, “perceived absence of risks”, “lack of awareness”, and “pregnancy experiences” were the most frequently identified barriers and “believing in the benefits” and “availability of PCC” the most frequently identified facilitators for PCC use.

Conclusions and Relevance: Women perceive more barriers than facilitators related to PCC uptake, which explains why the use of PCC remains low. Our results provide a starting point to refocus interventions and strategies, aiming on

enlarging the awareness, perceived importance, and accessibility of PCC to improve its uptake.

Target Audience: Obstetricians and gynecologists, family physicians.

Learning Objectives: After completing this activity, the learner should be better able to (1) appraise the recent literature on barriers and facilitators that affect the uptake rates of preconception care; (2) discuss which perceptions women hold regarding the use of preconception care; and (3) take these factors into account while designing preconception care interventions and strategies.

Preconception care (PCC) is an approach to optimize pregnancy outcomes. Antenatal care often starts too late to prevent serious maternal and child health problems, as the first gestational weeks are of utmost importance for embryonic growth and development.¹ Preconception care focuses on the period before conception, providing a preventive window of opportunity to timely alter or eliminate risk factors for adverse pregnancy outcomes.

^{2,3} The United States Centers for Disease Control defines PCC as “a set of interventions that aim to identify and modify biomedical, behavioral and social risks to a woman's health or pregnancy outcome through prevention and management”.² The key components of PCC include risk assessment, health promotion, and medical and psychosocial interventions.⁴ Individual PCC counseling may encompass information about lifestyle, obstetrical history, hereditary diseases, immunization, and medication use.⁵ The attention for PCC has grown substantially over the past decades and national guidelines and recommendations have been developed in many western countries.^{2,6,7} Although PCC is increasingly being offered, awareness of PCC among the target population is generally limited and the use of PCC remains low.⁸ Research indicates that almost all couples planning pregnancy have at least one risk factor for adverse pregnancy outcomes, and most of these risk factors continue to be prevalent during pregnancy.^{9,10} Preconception care has demonstrated to improve knowledge and change risk behaviors to optimize future pregnancy outcomes and future health.^{11–13} Yet, the percentage of couples seeking or receiving PCC is disappointing. In the United States, the Pregnancy Risk Assessment Monitoring System was used to analyze data from 2004 to 2010 from a large sample of women. Overall, only 31% of women reported receiving PCC or consulting a health care provider before conception to prepare for a healthy pregnancy. Moreover, women with a high risk for adverse pregnancy outcomes were less likely to have received PCC.¹⁴ These findings are consistent with a cross-sectional survey study among pregnant women in the United Kingdom, in which only 27% of women visited a health professional for advice about getting pregnant.

¹⁵ Despite several attempts to improve the uptake of PCC through tailored interventions and preconception care clinics, it is not clear why women remain hesitant to seek and receive PCC.

In this study, we aimed to systematically review the current literature on factors underlying the differences in PCC uptake. In 2002, Korenbrot et al¹⁶ conducted the first systematic review on preconception care, focusing on evidence for its effectiveness. In 2011, Delissaint and McKyer¹⁷ performed another systematic review on factors relating to preconception health status and health behaviors. A critical finding in that review was that knowledge and awareness do not lead to

preconception health practices.¹⁷ Our study builds on their previous work by examining what factors women perceive as barriers and facilitators for the use of preconception care.

METHODS

Search Strategy

Four databases (MEDLINE, Embase, CINAHL, and PsycINFO) were searched for English peer-reviewed literature up to February 2015. A search syntax was used with a combination of 3 groups of keywords: (1) terms defining the domain “preconception care”; (2) terms identifying determinants, such as “factors”, “facilitators”, and “barriers”; and (3) terms related to “use”, such as “uptake”, “receipt” and “attendance”.

The complete search syntax is listed in Table 1.

[TABLE 1]

Selection Strategy

Two authors (M.P. and H.vS.) were responsible for article selection. Both authors simultaneously screened the first 150 titles and abstracts. Discrepancies for inclusion or exclusion were discussed, and the selection strategy was further specified. One author (M.P.) screened all remaining titles and abstracts. In case of doubt, again, both authors discussed the selection. Subsequently, both authors screened all full-text articles.

The references of included studies were checked for other eligible articles for this review (snowball method).

The following inclusion criteria were applied: original and peer-reviewed research in English; research from Western countries; qualitative and quantitative research; research in which participants were women with a pregnancy wish, pregnant women, women with past pregnancy, or women in the reproductive age (15–44 years); studies describing the use of preconception care; studies describing women's perceived barriers and facilitators for the use of PCC. Studies evaluating or describing the effect of a PCC intervention were excluded. In addition, studies focusing on a single part of preconception care (eg, folic acid supplementation or carrier screening) were excluded, as well as studies from which only a conference abstract was available.

Data Extraction and Analysis

We included both quantitative and qualitative studies. The quality of included articles was assessed by 2 authors (M.P. and H.vS.), using the Critical Appraisal Skills Program checklist for qualitative articles and the Health Evidence Bulletins—Wales checklist for quantitative articles.^{18,19} There is little empirical evidence on which criteria exclusion decisions should be based in mixed studies reviews.²⁰ Therefore, we decided to report on the quality of each article rather than to exclude articles. Moreover, topics present in at least 2 studies were automatically included in the results. Topics present in only one article were included when the study was judged to be of sufficient quality. Data extraction and analysis was performed using the NVivo version 10 software.²¹ Thematic analysis was used to identify key topics and themes.²² One author (M.P.) developed an initial coding frame by reading and

rereading the extracted findings and subsequently coded the results into topics and themes. Emergent topics were added when results did not fit the coding frame. Extraction and coding was verified by a second author (H.vS.) and discrepancies were discussed until consensus was attained.

RESULTS

Studies Included

The literature search generated a total of 2260 results. Seventeen publications met all inclusion criteria, and the snowball method added 4 more articles (Fig. 1). In total, 21 articles were included for analysis of which 10 with a qualitative design and 11 with a quantitative design. All studies were carried out in Western countries. In 10 of the articles, a specific target group was sampled: women with pregestational diabetes, infertility patients, African American women and Mexican American women.

The characteristics of the included studies are displayed in Table 2.

[FIGURE 1]

[TABLE 2]

Quality of Reviewed

Articles Most studies met the criteria from the quality appraisal checklists. The checklist for qualitative articles contained one item, that is, the adequate consideration of the relationship between the researcher and study participants, which was met in only one study.³³ The other studies did not provide sufficient information on this matter. The method of analysis was not described in 2 quantitative studies and 1 qualitative study.^{27,29,33} The 2 quantitative studies only used descriptive analyses and no statistical tests to report on their results.^{27,29} Therefore, not meeting this criterion was considered of minor influence on the quality of these articles. The qualitative study used the participatory research process and did elaborate on the application of this method.

However, the authors did not describe how they further analyzed the retrieved “webs of ideas” but did present participant quotations to support authors' interpretations.³³ Therefore, we decided to use the results under the condition that topics had to be present in at least one other article. Only one quantitative study explicitly considered possible confounding and bias, which may be due to the descriptive character of the articles.²⁶ Three other studies did report on moderator variables or used a multiple regression model to investigate associations between variables.^{24,30,36} We could not retrieve whether ethics were considered in all studies, as 11 of the 21 articles did not report on ethics. Either comprehensive description on obtaining informed consent of participants or institutional review board approval was lacking in these studies.^{5,23,27,28,31–33,36–38,40} Nine studies met all the criteria from the quality appraisal checklists.^{8,24–26,30,34,35,39,41} Yet, the overall quality of all included studies was good and adequately reported.

Synthesis of the Findings

Seven major themes were derived from thematic analysis: preconditions, emotions and beliefs, perceived need, knowledge and experience, social structure,

accessibility, and provider characteristics. Table 3 provides an overview of themes and topics in the included studies, classified into barriers (–) and facilitators (+) for the use of preconception care. More barriers than facilitators were identified in the included studies.

The most frequently identified barriers were “lack of awareness”, “perceived absence of risks”, “pregnancy experiences”, and “not (fully) planning pregnancy”.

The most frequently identified facilitators were: “believing in the benefits” and “availability of PCC”. A description of the findings is given below.

Theme 1: Preconditions

We identified interest as one of the facilitators to engage in PCC. Six included studies reported that most women are interested in PCC, with percentages ranging from 54% to 86%.^{24,26–29,39,41} Women should know about the existence of PCC to decide on using PCC, therefore lack of awareness was identified as a barrier for the use of PCC. Eight studies stipulate lack of awareness and unfamiliarity with the concept of PCC.^{23,25,31–33,35,37,41} Charron-Prochownik et al. performed a study among adolescent women with diabetes.

One of their most significant findings was the strong association ($P \leq 0.01$) between initial awareness of PCC and seeking PCC.²⁴ However, 65% of the respondents in this study stated they never heard of PCC.²⁵ Other studies report that the idea of PCC is foreign to many women, feels abstract, or that the term “preconception care” is too clinical and puts women off.^{23,35,37} Despite the possibilities of birth control, many pregnancies in Western countries remain unplanned. Not (fully) planning pregnancy was identified as an important barrier for attending PCC, as mentioned in 8 of the included articles.^{23,27,28,32,34,37,38,41} Illustratively, de Jong-Potjer et al and Elsinga et al found that the major reason (54%–67%) for refusing PCC was that women had no wish for (another) pregnancy.^{27,28} Several studies describe the phase between pregnancy planning and actual conception to be indistinct: women do not always make a strategic decision to conceive, convince themselves they are sterile, or conceive sooner than expected.^{23,32,37,38}

[TABLE 3]

Theme 2: Emotions and Beliefs

The wish for secrecy is mentioned in 2 articles as a barrier for PCC use.^{37,38} Many women prefer to keep their pregnancy plans intimate between them and their partners, which affects their willingness to tell others, including health professionals.^{37,38} Moreover, women wish for normality, as they feel that the process of getting pregnant should be surrounded by “natural” and “romantic” values and should not become artificial.³⁸ Especially women with pregestational diabetes, who already are in the medical realm, wish to have a normal and positive experience of conception and pregnancy, which could be endangered by too much monitoring following PCC.³² Five studies reported feelings of anxiety and fears, which could interfere with the use of PCC. These include personal fears, such as fear for disappointment, the unknown, and blood withdrawal.^{32,33,36} Moreover, women experience fears in relation to health care providers, such as fear to ask questions; fear for embarrassment; fear of being labeled, judged, or lectured; and fear that confidential information might be passed on to relatives.^{33,34,37} We identified believing in the benefits as one of the most imperative facilitators for the uptake of PCC, as it was mentioned in 10 included studies.^{5,8,24,26,30,32,33,35,37,38}

Although perceived lack of control over birth outcomes could be an issue, 7 studies report that optimizing the health of mother and child is an important motive for women to engage in PCC.^{8,24,26,30,32,33,35} In addition, 3 studies report that the prospect of being better informed by health providers also contributes to the belief that PCC is beneficial.^{5,37,38}

Theme 3: Perceived Need

The perceived relevance and importance of PCC was predominantly identified as a barrier for PCC uptake in this review. Yet, there was lack of consensus in the literature as the percentages of women who regarded PCC to be important fluctuated from less than 40% to 99%.^{29,31,36,39,40} A possible explanation for these contradictory findings provided by the literature is that women do not regard PCC as relevant to themselves but do consider PCC useful for other women.^{5,32,37,38} Six studies report on this perceived absence of risks and perceived healthy lifestyle among women, which minimized their need of PCC.^{5,8,23,33,37,38} Illustratively, in the study by van der Zee et al., women reported to have conducted their own risk analysis and concluded they were “safe” or could handle the risk.³⁸ This perception generally changes when women become pregnant, as risks then become relevant and seeking care is recognized as a necessary subsequent step.^{8,37} Women tend to perceive conception as a normal event that most women go through, and they associate seeing a health care provider with health problems and acute care.^{8,23} Therefore, medicalization of conception was identified as an inhibiting factor for PCC use, as women do not perceive a need for medical attention before conception and wish for less medical input.^{8,23,32} By contrast, in case of fertility concerns, PCC is generally considered relevant and appropriate, although Murphy et al. found that both realistic and perceived fertility concerns could also act as an impeding factor for PCC out of fear for negative advice.^{5,23,32,37,38}

Theme 4: Knowledge and Experience

Perceived sufficient knowledge constitutes an important barrier in PCC attendance, as this factor was reported in 5 studies.^{5,8,28,38,41} In the studies by van der Zee et al. and Mazza and Chapman, women reported they had already found the relevant information in books, on the Internet, or from friends and family.^{8,38} Eight studies mentioned past pregnancy experiences as an impeding factor for PCC use as well, as women feel they are experienced mothers, already knowing about PCC issues.^{5,8,32,36–38,40,41} There are mixed messages in the literature regarding experience with poor pregnancy outcomes, as one study found that this factor contributed to PCC use, whereas 2 other studies found opposite results.^{23,32,36}

Theme 5: Social Structure

Four articles reported social support as a facilitator for PCC use.^{30,33,35,36} Although nonsignificant, in the studies by Temel et al. and Janz et al., most women reported their partner's opinion to be very important.^{30,36} By contrast, social pressure could interfere with women's willingness to use PCC.^{32,36–38} An important reason to keep secrecy is that women do not want to create expectations they will not be able to meet and do not want other people to involve or inquire about their pregnancy plans.^{32,38} Apart from this, religion might also inhibit PCC attendance, as some communities may sanction “conception” only in marriage.^{36,37}

Theme 6: Accessibility

The accessibility of preconception care has major influence on its uptake, as difficulty accessing PCC makes it more difficult to use PCC services. Logistical

concerns, such as living in rural areas and travel issues, make PCC less accessible.^{8,32,41} Three studies indicate that lack of adequate finances impedes on PCC uptake.^{8,32,35} However, in one study performed in the UK, women did not perceive money as inhibiting because health care is free in this country.³⁴ Another barrier reported by 4 studies is that women find it difficult to commit their time and effort to PCC.^{32,33,36,41} This seems especially the case when other commitments compound women's demands, such as taking care of their other children.^{33,37} We found that the way in which PCC is offered within the health care system, either demand or supply driven, can make a substantial difference for the uptake of PCC. The results of 7 studies suggest that provider encouragement and the active offer of PCC facilitates uptake.^{8,27,28,30,35,37,40} However, 5 studies show that in daily practice, women are mostly not being offered PCC by health care providers and information is not as readily available.^{8,29,33–35} Illustratively, Frey and Files²⁹ report that only 39% of their respondents could ever recall their physician discussing preconception health. Moreover, the opportunistic offer of PCC during general practice may not always be appreciated.^{32,40} Wallace and Hurwitz⁴⁰ found that acceptability was substantially lower the less closely the original visit related to pregnancy. Discussing PCC is perceived more appropriate during obstetric/gynecology appointments or while consulting the general practice for contraception or Papanicolaou tests.^{35,40}

Theme 7: Provider Characteristics

Preconception care counseling can be delivered by several health care providers, such as general practitioners, practice nurses, midwives, and gynecologists. Some specific characteristics of these providers matter for women in their decision to use PCC. An example is that some women prefer to speak with female providers.^{34,37} Four studies report that positive provider attitudes contribute to PCC use, such as professional support, reassurance, encouragement, respect, trust, and confidentiality.^{30,33,37,38} By contrast, negative provider attitudes were mentioned as barriers for PCC use in 2 studies and concerned perceptions of providers being nonreliable, judging, stereotyping, controlling, directive, restrictive, authoritative, or unsupportive of women's needs.^{34,37} Moreover, 3 studies reported on communication issues with providers, which we identified as barriers for PCC use.^{32,34,37} Previous negative experiences with health services was mentioned as a reason for nonattending PCC in 3 studies, whereas previous positive experiences with health services and being formerly involved with PCC were factors that contribute to the use of PCC.^{8,32–34} One study found that women were generally positive about the prospect of greater PCC owing to continuity of positive provider relationships.³⁷ Correspondingly, not having such an ongoing provider relationship was suggested to be a barrier PCC uptake.^{8,34}

DISCUSSION

To the best of our knowledge, this is the first systematic review of studies on women's perceptions of barriers and facilitators for the use of preconception care. The aim of the review was to identify factors that underlie the differences in PCC uptake. Thematic analysis distinguished 7 themes that are important for women in their consideration to use PCC: preconditions, emotions and beliefs, perceived need, experience, social structure, accessibility, and provider characteristics.

These findings are rigorous, as we included 21 good-quality articles, both qualitative and quantitative studies, and attained data-saturation during analysis.

Our findings indicate that factors women perceive as relevant for PCC uptake are predominantly barriers, which explains why the use of PCC remains low. Strikingly, almost all identified barriers and facilitators relate to the same topics and themes. For example, already having children was identified a barrier, whereas not having children was identified a facilitator for PCC uptake.

This indicates that our dichotomous categorization into barriers and facilitators in reality is more a continuum, as women might shift their perceptions depending on time and context. Furthermore, the identified factors interrelate, which suggests that deciding on the use of PCC is a subtle process, determined by the presence of preconditions, women's beliefs, perceptions, and experiences, given the availability and context in which PCC is provided.

The Andersen Behavioral Model of Health Services Use can be applied to reflect on the themes and topics identified by this systematic review. This model supposes that health care use is a function of 3 determinants: predisposing characteristics (demographic, social, and health belief factors), enabling resources (health system and organizational characteristics, financial and personal factors) and need (perceived and evaluated need).⁴² Interestingly, most of both barriers and facilitators identified in this review correspond with Andersen's category of predisposing characteristics. This suggests that most factors related to PCC use have limited amenability to change, as they are fixed within the intrapersonal level. The barriers for PCC use most frequently identified in this review were lack of awareness, perceived absence of risks, pregnancy experiences, and not (fully) planning pregnancy. The most frequently identified facilitators were believing in the benefits and availability of PCC. Of these factors, availability of PCC was reported in the included studies to be both a barrier and facilitator factor. Given this, and the fact that this factor is an enabling resource on the organizational level, we single out availability of PCC as the factor most inclined to change by interventions and strategies.

Our findings indicate that perceived absence of risks is one of the most important barriers for PCC use, although evidence shows that almost all couples planning for pregnancy have at least one risk factor for adverse pregnancy outcomes.⁹ Moreover, several studies indicate that levels of knowledge regarding preconception health are high among women planning for pregnancy.

^{11,26,29,39,43} Yet, evidence suggests that whereas PCC is effective to change risky health behaviors, having knowledge alone is not enough.^{11–13,43} Therefore, an increase in the awareness and perceived importance of PCC is desirable. We recommend developing communication and marketing strategies to increase women's awareness that PCC is important to all couples planning pregnancy. Our findings suggest that promotional messages should focus on highlighting possible risks and emphasizing on the benefits associated with PCC, which was indicated as the most important motivator for women to engage in PCC.

However, marketing strategies will not reach all women, as many pregnancies in Western countries remain unplanned.⁴⁴ In the US, 51% of the pregnancies are unintended.⁴⁵ In the UK, these percentages are lower; approximately 16% of pregnancies are unplanned and approximately 29% is ambivalent.⁴⁶ This review shows that the intention to become pregnant is indeed more a continuum between

planned and unplanned, which is supported by other studies.^{47–50} To not miss women who are not (fully) planning pregnancy, it is widely recommended for providers to focus on all women of childbearing age by offering PCC opportunistically during other health encounters.^{1–3,51} However, our findings indicate that to date, the integration of PCC with primary health care is far from routine.

Moreover, we found that although actively offering PCC has the potential to motivate women, it may not always be appreciated. Therefore, we recommend to enlarge the availability of PCC by investing in other means of delivery, such as walk-in-hours, group sessions, and online consultation. A recent systematic review indicates there is no consensus on how PCC should best be delivered owing to heterogeneity of risk factors, health systems, and strategies.⁵² Moreover, other studies support our finding that practical constraints and provider characteristics also play an important role in the accessibility of PCC services, such as costs, distance, time and effort, trust, the quality of provider relationships, and previous health services experiences.^{53–58} Therefore, we recommend to design interventions with specific attention to local situations by diminishing possible logistical and financial barriers and enlarging the offer of PCC. From this perspective, we consider it useful to introduce core preconception wellness measures at the initiation of prenatal care, including pregnancy intention and access to care, as advocated by Frayne et al⁵⁹ in a recent publication. These health care system measures allow for comparison of the aforementioned regional differences in PCC practice and monitor improvements over time.

Strengths and Limitations

A strength of this review lies in the extensive search strategy, using 4 databases from different fields of medical health care and social sciences. Moreover, there was good representation of the main themes in most of the included studies, and all topics were present in at least 2 studies and saturation was achieved.

We carried out a mixed studies review by including both quantitative and qualitative articles. The strength of this approach is that it allows for more extensive and in-depth understanding. The use of thematic analysis allowed us to identify key topics and themes. Yet, combining qualitative and quantitative results might be challenging, as interpretation and generalization go across different designs and data collection methods.

Therefore, 2 authors contributed to data analysis, which enlarged rigor. Moreover, almost all qualitative studies included participant quotations to support authors' interpretations, which enhanced analysis. The degree to which quantitative and qualitative results could be integrated was also high. All themes and almost all topics were present in both quantitative and qualitative research (Table 3). One article did not entirely meet the criteria of the checklist used for quality appraisal.³³ However, the results did contribute to our data, as it supported our findings for 10 topics in 6 themes. As these topics were present in other studies as well, the contribution was considered supportive rather than decisive.

Ten of the 21 included articles concerned specific populations, with an overrepresentation of women with diabetes mellitus. These women might have different perceptions compared to the general population, as they have higher risks for adverse pregnancy outcomes and have regular health encounters. Another limitation was that we only included studies from Western countries.

Our rationale was that experiences from women in non-Western and Western countries are incomparable owing to differences in health care systems, living standards, and health issues. However, we found that these differences also exist between Western countries, as the affordability and availability of PCC closely relates to the organization of primary care and billing and reimbursement options within the health insurance system.^{1,60} Although topics regarding the accessibility of PCC were presented by studies conducted in multiple countries (USA, UK, the Netherlands, Ireland, and Australia), the generalizability of our findings is limited, as perceptions might vary between countries.^{8,27–30,32–37,40,41} Therefore, it is recommended to carefully account for the local situation while designing interventions and to introduce preconception baseline measures to allow for monitoring and comparison between regions.

CONCLUSIONS

This review illustrates that deciding on the use of PCC is a subtle process, determined by the presence of preconditions, women's beliefs, perceptions, and experiences, given the availability and context in which PCC is provided. We are confident that our findings are rigorous, as they are supported by 21 good-quality studies and saturation of both themes and topics was achieved.

Our results show that PCC misses its potential by the current way in which it is offered, as many pregnancies remain unplanned and couples tend to keep their pregnancy wish secret. Thus, it is recommended to enlarge the availability of PCC by investing in other means of delivery while paying specific attention to local situations and subpopulations. Moreover, we recommend to enlarge the awareness and perceived importance of PCC by means of promotional messages, highlighting possible risks and emphasizing on the benefits associated with PCC. Our results contribute to the literature by providing a starting point to refocus interventions and strategies aimed at improving PCC uptake by taking into account factors that women perceive as barriers and facilitators. We urge to apply these recommendations to both current and future policy in order for PCC to reach its potential. A paradigm shift is needed for PCC to become as self-evident as prenatal care and to improve the health of future generations.

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TABLES AND FIGURE

TABLE 1
Search Syntax

DOMAIN: preconception, pre-conception, pre-pregnancy, pre-prenatal, periconception, interconception | care, advice, consult, counseling, assessment, intervention, treatment, referral, screening, diagnosis, prevention, health promotion, risk assessment.

DETERMINANT: determinant, variable, factor, aspect, motives, motivation, facilitator, barrier, constraint, benefit, success, fail, advantage, disadvantage, condition, term, decision, reason, choice, attitude, emotion, perception, perspective, intention, subjective, belief, wish, fear, value, norm, need, influence, awareness, ethics, moral, importance, ability, access, inform, knowledge, skill, self-efficacy.

OUTCOME: use, usage, utilization, reach, receipt, uptake, attend, visit, participation, acceptance.

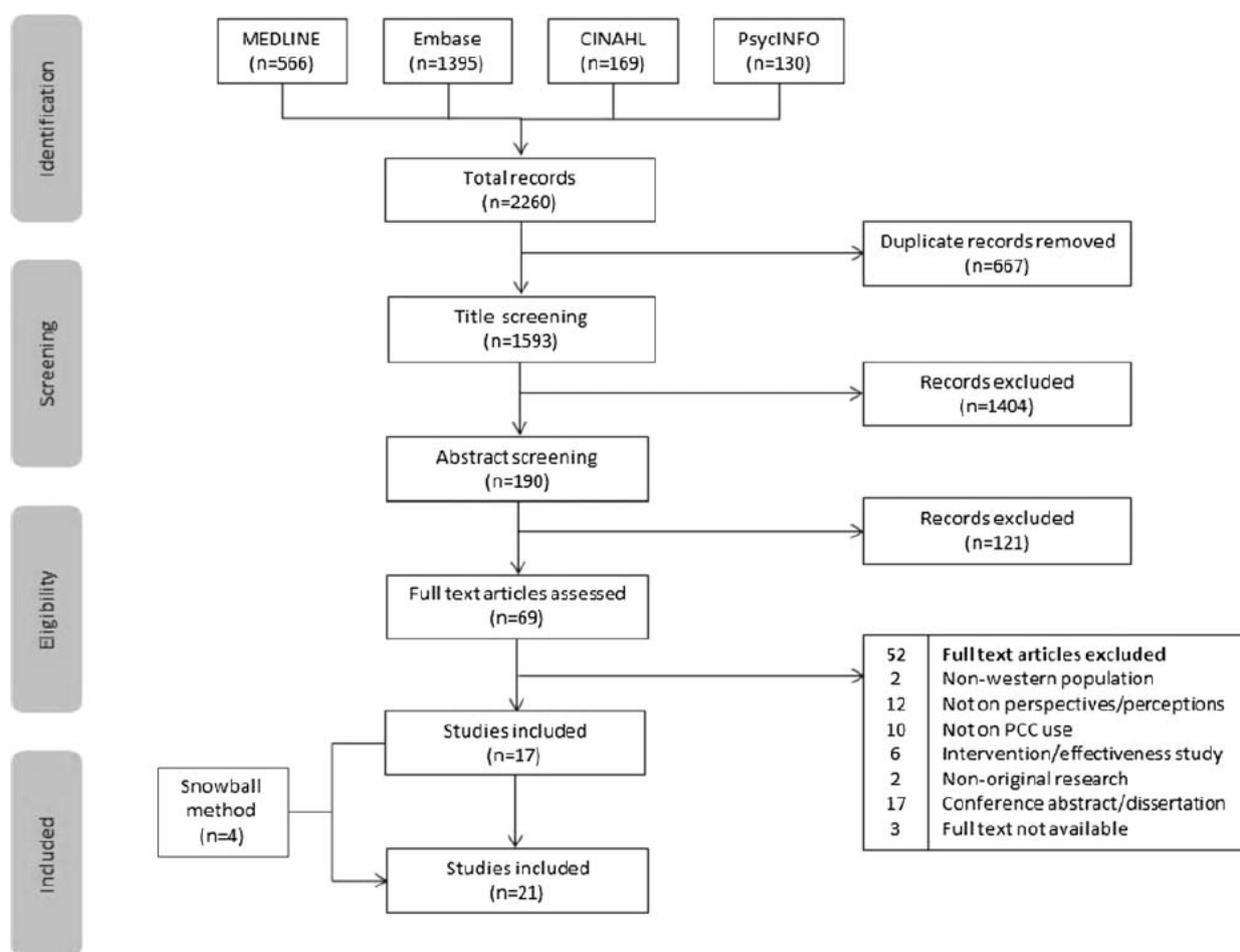


FIG. 1. Flow chart of article selection process.

TABLE 2

Characteristics of the 21 Included Studies

Study	Year	Country	Design	Data Collection	N	Sample
Canady et al ²³	2008	USA	Qualitative	Focus groups	168	African-American
Charron-Prochownik et al ²⁴	2001	USA	Quantitative	Questionnaires	80	DM 1
Charron-Prochownik et al ²⁵	2006	USA	Qualitative	Open-ended questionnaire	80	DM 1
Coonrod et al ²⁶	2009	USA	Quantitative	Questionnaires	305	Mexican-American
de Jong-Potjer et al ²⁷	2003	the Netherlands	Quantitative	Questionnaires	1206	
Elsinga et al ²⁸	2006	the Netherlands	Quantitative	Questionnaires	14915	
Frey and Files ²⁹	2006	USA	Quantitative	Questionnaires	499	
Hosli et al ⁵	2008	the Netherlands	Qualitative	Semi-structured interviews	11	
Janz et al ³⁰	1995	USA	Quantitative	Questionnaires	154	DM 1 + 2
Mazza and Chapman ⁸	2010	Australia	Qualitative	Focus groups	17	
Mitchell et al ³¹	2012	USA	Quantitative	Questionnaires	2736	
Murphy et al ³²	2010	UK	Qualitative	Semi-structured interviews	29	DM 1 + 2
O'Higgins et al ³³	2014	Ireland	Qualitative	Participative research	14	DM 1 + 2
Spence et al ³⁴	2010	UK	Qualitative	Focus groups	24	DM 1 + 2
Squiers et al ³⁵	2013	USA	Qualitative	Focus groups	65	
Temel et al ³⁶	2013	the Netherlands	Quantitative	Questionnaires	631	
Tuomainen et al ³⁷	2013	UK	Qualitative	Focus groups / semi-structured interviews	41 / 19	
Van der Zee et al ³⁸	2013	the Netherlands	Qualitative	Semi-structured interviews	16	
Vause et al ³⁹	2009	Canada	Quantitative	Questionnaires	400	Infertility patients
Wallace and Hurwitz ⁴⁰	1998	UK	Quantitative	Questionnaires	811	
Zhu et al ⁴¹	2012	Australia	Quantitative	Questionnaires	51	DM 1 + 2

TABLE 3
Themes and Topics in the Included Studies

Barrier (n)	Facilitators (n)	Canady et al., 2006 ²³	Charon-Prochownik et al., 2001 ²⁴	Charon-Prochownik et al., 2006 ²⁵	Coonrod et al., 2009 ²⁶	de Jong-Potjer et al., 2003 ²⁷	Eisinga et al., 2006 ²⁸	Frey and Files, 2006 ²⁹	Hosli et al., 2008 ⁵	Janz et al., 1995 ³⁰	Maza and Chapman, 2010 ⁸	Mitchell et al., 2012 ³¹	Murphy et al., 2010 ³²	O'Higgins et al., 2014 ³³	Spence et al., 2010 ³⁴	Squiers et al., 2013 ³⁵	Temel et al., 2013 ³⁶	Tuomainen et al., 2013 ³⁷	Van der Zee et al., 2013 ³⁸	Vause et al., 2009 ³⁹	Wallace and Hurwitz, 1998 ⁴⁰	Zhu et al., 2012 ⁴¹		
1. Preconditions																								
Interest	1	6	+		+	+	+	+													+		-	
PCC Awareness	8	2	-	+	-						+	-	-	-										
Pregnancy planning	8	1	-			-	-				+		-		-									
2. Emotions and beliefs																								
Wish for secrecy	2	0																						
Wish for normality	2	1												-	+									
Anxiety & fears	5	0												-	-	-								
Benefits	2	10		+		+			+	+	+		+	+		+/-	-	+	+					
3. Perceived need																								
Perceived relevance & importance	6	3						+	-			+	-									+		-
Perceived risk status	7	0	-			-			-		-			-										
Medicalization of conception	3	1	-								-		-											+
Fertility concerns	1	4	+						+															+
4. Experience																								
Sufficient knowledge	5	0					-		-		-													-
Pregnancy experiences	8	2	+						-		-		+/-											-
5. Social structure																								
Social system	4	5								+			-	+		+	+/-	-	-					
Religion	2	0																-	-					
6. Accessibility																								
Distance/rurality	3	0									-		-											-
Cost	3	1									-		-		+	-								
Time and effort	4	0												-										-
Availability	6	7				+	+	-	+	+/-			-	-	-	-				+			+/-	
7. Provider characteristics																								
Female provider	0	2														+								+
Provider attitudes	2	3							+						+	-								+
Communication issues	3	0												-										-
Experiences with health services	3	3									-		+/-	+	-									+

Classified into barriers (-) and facilitators (+) for the use of preconception care.