



Current preconception care practice in the Netherlands — An evaluation study among birth care professionals

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ARTICLE INFO

Keywords:

Preconception
Preconception care
Midwifery practice
Obstetric care
Lifestyle
Birth
Pregnancy

ABSTRACT

Objective: To evaluate the current practice of preconception care in the Netherlands and the perceptions of birth care professionals concerning preconception care.

Methods: We have developed a digital questionnaire and conducted a cross-sectional study by distributing the questionnaire among 102 organisations: 90 primary care midwifery practices and obstetric departments of 12 hospitals in the Southwest region of the Netherlands between December 2020 and March 2021. One birth care professional per organization was asked to complete the questionnaire. Descriptive statistics were used to present the results.

Findings: Respondents of eighty-three organisations (81.4 %) filled in the questionnaire, of whom 74 respondents were independent primary care midwives and 9 respondents were obstetricians. Preconception care mostly consisted of an individual consultation in which personalized health and lifestyle advice was given. Among the respondents, 44.4 % reported that the organization had a preconception care protocol. The way in which the consultation was carried out, as well as the health and lifestyle related questions asked, differed between respondents. More than 85 % of the respondents inquire about the following possible risk factors for complications: maternal illnesses, obstetric history, folic acid supplement intake, alcohol intake, smoking, substance abuse, hereditary disease, prescription medication, dietary habits, overweight, and birth defects in the family. The respondents acknowledged that preconception care should be offered to all couples who wish to become pregnant, as opposed to offering preconception care only to those with an increased risk of complications. Still, respondents do not receive many questions regarding the preconception period or requests for preconception care consultations.

Key conclusion: Birth care professionals acknowledge the need for preconception care for all couples. In the Netherlands, preconception care consists mostly of an individual consultation with recommendations for health and lifestyle advice. However, the identification of risk factors varies between birth care professionals and less than half of the respondents indicate that they have a protocol available in their practice. Furthermore, the demand of parents-to-be for preconception care is low. More research, that includes more obstetricians, is necessary to investigate if there is a difference between the care provided by primary care midwives and obstetricians.

Implications for practice: To increase the awareness and uptake of preconception care, it would be prudent to emphasize its importance to parents-to-be and professionals, and actively promote the use of widespread, standardized protocols for birth care professionals.

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<https://doi.org/10.1016/j.midw.2023.103855>

Received 7 February 2023; Received in revised form 11 October 2023; Accepted 13 October 2023

Available online 16 October 2023

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Introduction

Maternal health, weight, and lifestyle prior to pregnancy, in the preconception period, influence women's health during pregnancy, the intra-uterine development of the embryo and fetus, and even the lifelong health of the future offspring (Gluckman et al., 2010; Freeman, 2010; Nielsen et al., 2016). Optimizing these factors before pregnancy may therefore help improve embryonal and fetal development and subsequent pregnancy outcomes (Maas et al., 2021). Preconception care (PCC) is especially designed for this purpose and aims to identify and ameliorate risk factors of parents-to-be that may otherwise increase the risk of adverse pregnancy outcomes. Two types of PCC can be distinguished: generalized and specialized PCC. Generalized PCC consists of assessment of risk factors and general lifestyle advice, personalized for the parents-to-be. Generalized PCC is given by primary care midwives (with independent practices) and general practitioners (GPs), and targets all couples who wish to have a child. Specialized PCC is usually given in a hospital setting by obstetricians or clinical midwives and is directed more specifically towards couples who have or expect medical problems that may influence the course of the pregnancy. See Box 1 for an explanation of the Dutch birth care system.

Throughout the years, multiple definitions of PCC have been formulated. Temel et al. (2015) have, most recently, defined PCC as follows: *"A set of interventions and/or programmes that aims to identify and enable informed decision-making to modify biomedical, behavioural, and (psycho)social risks to parental health and the health of their future child, through counselling, prevention and management, emphasizing those factors that must be acted on before conception and in early pregnancy, to have maximal impact and/or choice."* (Temel et al., 2015). This definition of PCC is all-encompassing and accurately reflects the need of successfully implementing adequate PCC.

In the Netherlands, perinatal morbidity and mortality rates are relatively high, and perinatal outcomes greatly differ between deprived and non-deprived neighbourhoods (Waelput et al., 2017; Poeran et al., 2013; de Graaf et al., 2008). These differences can be (partially) explained by differences in lifestyle between women with a high socioeconomic status (SES) and those with a low SES (de Graaf et al., 2013; Metcalfe et al., 2011). Still, poor lifestyle behaviours that may influence pregnancy outcomes, such as smoking, no folic acid use, and low vegetable intake, occur in over 80 % of all women who wish to become pregnant (de Weerd et al., 2003). This underlines the importance of PCC and improving the modifiable factors that influence the health of parents-to-be and their children, now and in later life.

Well-implemented and effective PCC is essential to reduce or prevent adverse pregnancy outcomes. A multitude of PCC interventions are deemed effective, but studies on this topic show substantial clinical heterogeneity and therefore, true effectiveness is unclear (Temel et al., 2014). This influences caregivers' perceptions regarding the usefulness of and need for PCC (M'Hamdi et al., 2017). There is, however, a positive trend in the provision of PCC in the Netherlands. In 2011, a guideline was developed for general practitioners in the Netherlands, for PCC (de Jong-Potjer et al., 2011). Subsequently, in 2018, the Preconception Indication List (PIL) was composed by multiple parties such as the College for Perinatal Care (CPZ), the Royal Dutch organisation of Midwives (KNOV), the Dutch Society of Obstetrics and Gynaecology (NVOG), and the Dutch Association for Pediatrics (NVK) (van Voorst et al., 2016). The PIL summarizes what PCC entails and specifies the current working agreements and partnerships between the different disciplines involved. These guidelines have brought structure; since then, PCC is offered more frequently by local caregivers, mainly primary care midwives, in addition to specialized PCC given by obstetricians in the hospital. The way in which PCC is practiced nevertheless still greatly varies.

To effectively support the positive trend of PCC accessibility, current barriers delaying or prevent adequate conduction of PCC have to be identified. Therefore, the aim of this study was to evaluate the current

practice of PCC in the Netherlands and the perceptions of birth care professionals concerning PCC. The insights will provide an overview of the current situation, with which we may be able to specifically target barriers that stand in the way of optimally offering and conducting PCC.

Methods

Participants

All independent primary care midwifery practices and obstetric departments in hospitals in the Southwest region of the Netherlands were invited to participate in this survey study. This included 90 midwifery practices and the obstetric departments of 12 hospitals. Per organization, one birth care professional filled in the questionnaire.

Study design

A cross-sectional study design was used in which a digital questionnaire, specifically developed for this study, was sent to the participating organizations between December 2020 and March 2021.

The questionnaire

The questionnaire used in the present study is based on the questionnaire described in a study of van Voorst et al. (2016), which aimed to assess current PCC consultations, perceptions, and prerequisites for delivery of PCC in primary care in the Netherlands. The authors of the current study together decided the focus of this study and created a new questionnaire. Various independent researchers ($n = 4$) and birth care professionals ($n = 7$) piloted the questionnaire and provided feedback on the clarity and content, which led to the current questionnaire.

The questionnaire included 20 questions concerning basic characteristics, the organization of PCC, and perceptions of birth care professionals concerning PCC.

Statistics

The aim of this study is to describe the present situation of PCC provision and conduction. We have therefore used descriptive statistics. Continuous data is reported as mean, together with standard deviation (sd). Count data is reported as percentages. In the Netherlands, the birth care provided by primary care midwives differs from birth care provided by obstetricians and clinical midwives (see Box 1). Therefore, the results are not only presented for the whole population, but also separately for primary care midwives and for obstetricians. For this survey, all 12 obstetric departments in the South West region of the Netherlands were invited to participate and professionals of nine department have completed the survey. The low number of obstetricians makes comparison difficult and statistical analyses to compare the groups are not justified. Therefore, only descriptive statistics were used.

Results

Respondents

The questionnaire was sent to 102 birth care organizations, consisting of 12 obstetric departments and 90 independent primary care midwife practices. In total, 85 respondents filled in the questionnaire, of which two questionnaires only contained the basic characteristics and were therefore excluded from the analysis. The remaining 83 respondents (81.4 %) included 74 independent midwives and 9 obstetricians. Table 1 presents the characteristics of the respondents.

Among the respondents, 72 (86.7 %) indicated that PCC is provided by their organization, which includes all participating obstetricians and 63 midwives (85.1 %).

Box 1**Explanation of the Dutch birth care system**

In the Netherlands, the birth care system is divided between primary, secondary, and tertiary care. Primary care from GPs and midwives is directly accessible. Secondary care usually takes place in a hospital and is given by a medical doctor, such as an obstetrician, or by a clinical midwife who works under supervision of an obstetrician. Tertiary care is specialized care within a university medical center. Secondary and tertiary care require a referral from a primary care provider.

In the Netherlands, uncomplicated pregnancies and births are usually supervised by primary care midwives. If a medical problem arises, or the woman is at high risk of medical problems, care will take place or continue in secondary or tertiary settings.

Table 1

Respondents' characteristics.

	Primary care midwives (n = 74)	Obstetricians (n = 9)	Total (n = 83)
Age; mean $\pm$ sd	39.2 $\pm$ 10.2	46.2 $\pm$ 7.3	39.9 $\pm$ 10.1
Job experience (years); mean $\pm$ sd	13.8 $\pm$ 9.0	11.1 $\pm$ 5.9	13.5 $\pm$ 8.7
Organization provides PCC, yes	63 (85.1 %)	9 (100 %)	72 (86.7 %)

PCC consultation

PCC was often provided as a one-time consultation, mostly given in an individual setting. Most of the primary care midwives and all obstetricians indicated that they gave a personalized healthcare advice and 46 (63.9 %) respondents indicated that they also provided an advice during the post-partum period. Twenty respondents indicated that they reserved 15–30 min for a PCC consultation. Of the other respondents, 52 stated that a PCC consultation takes at least 30 min (Table 2).

During a PCC consultation, the birth care professional identifies health, dietary, and lifestyle factors that may increase the risk of adverse pregnancy outcomes. In the questionnaire, we summed up 31 known risk factors for adverse pregnancy outcomes. Respondents were asked to select those risk factors they inquired about during PCC consultations. The following possible risk factors were inquired by more than 85 % of the respondents: maternal illnesses, obstetric history, folic acid supplement intake, alcohol intake, smoking, substance abuse, hereditary disease, prescription medication, dietary habits, overweight, and birth defects in the family (Table 3).

Protocol/Tools

Overall, thirty-two (44.4 %) respondents – 30 midwives and two obstetricians – stated a PCC protocol was available in their organization at the time they filled in the questionnaire. Eight respondents skipped this question.

When specifically asked if they used e-health support, almost half of the respondents answered they did. Most respondents used 'Pregnant Wiser' (Dutch: *ZwangerWijzer*), a digital questionnaire filled in by the parents-to-be about risk factors for adverse pregnancy outcomes, that

Table 2

Time reserved for a preconception care consultation.

	Primary care midwives (n = 63)*	Obstetricians (n = 9)*	Total (n = 72)*
15–20 min	15 (23.8 %)	5 (55.6 %)	20 (27.8 %)
30–45 min	27 (42.9 %)	4 (44.4 %)	31 (43.1 %)
>45 min	21 (33.3 %)	0 (0 %)	21 (29.2 %)

* Only birth care professionals who provided PCC answered this question.

also serves as a guideline for the birth care professional with regard to what to advice or who to refer to when a risk factor has been identified. The PIL (Preconception Indication List), a summary of what PCC entails and that states the working agreements between birth care professionals, was used by 3 respondents. In total, 36 respondents referred parents-to-be to websites or web applications such as 'Pregnant Wiser'.

Frequency of delivery of PCC

Fig. 1a and 1b reflect how often respondents engaged in providing PCC and how often they received requests for, or questions concerning PCC in the last two months. Over half of the primary care midwives stated to have dealt with PCC only once or not at all in the last two months. This frequency was a little higher for the obstetricians, but still low.

Perceptions of birth care professionals

Fig. 2 gives insight in the perceptions of the respondents regarding PCC, based on four propositions in the questionnaire. This section of the questionnaire was filled in by eighty-one respondents. In total, eight respondents (9.9 %) indicated that PCC consultations should only be offered to women with an increased risk of complications. According to 52 (64.2 %) of the respondents, the scientific proof of the effectiveness of PCC is sufficient. Twenty-four (29.6 %) respondents had 'no opinion' on this item and five (6.3 %) others stated that the effectiveness is insufficiently established. Most respondents (70; 86.4 %) disagreed with the proposition that health care providers are not essential in delivering PCC because there are sufficient other information sources. Almost all respondents (74; 91.4 %) disagreed with the proposition that parents-to-be should pay for PCC themselves.

Discussion**Main results**

This survey study aimed to provide an overview of the current practice of PCC in the Southwest region of the Netherlands and the perceptions of birth care professionals concerning PCC. A questionnaire was sent to 102 birth care organizations, with the condition that only one person per organization was to fill in the questionnaire. In total, eighty-three (81.4 %) questionnaires were returned. PCC consisted mostly of an individual consultation in which the birth care provider offered personalized health and lifestyle advice. Less than half of the respondents stated that the organization had a PCC protocol available. Most respondents used a questionnaire or tool to identify risk factors for adverse pregnancy outcomes. The necessity of PCC was acknowledged by the respondents for both women with and without an increased risk of complications. The respondents did not receive many questions about the preconception period or requests for PCC.

Table 3

Risk factors for adverse pregnancy outcomes and percentages of respondents addressing these in preconception care consultations.

	Primary care midwives (n = 63)	Obstetricians (n = 9)	Total (n = 72)
Maternal illness of the mother	60 (95.2 %)	9 (100 %)	69 (95.8 %)
Smoking	59 (93.7 %)	9 (100 %)	68 (94.4 %)
Obstetric history	58 (92.1 %)	9 (100 %)	67 (93.1 %)
Alcohol intake	57 (90.5 %)	8 (88.9 %)	65 (90.3 %)
Hereditary disease	57 (90.5 %)	7 (77.8 %)	64 (88.9 %)
Drug use	55 (87.3 %)	8 (88.9 %)	63 (87.5 %)
Medication on prescription	55 (87.3 %)	8 (88.9 %)	63 (87.5 %)
Being overweight	53 (84.1 %)	9 (100 %)	62 (86.1 %)
Birth defects in the family	56 (88.9 %)	6 (66.7 %)	62 (86.1 %)
mental health problems	49 (77.8 %)	8 (88.9 %)	57 (79.2 %)
gynecological operations	46 (73.0 %)	9 (100 %)	55 (76.4 %)
Dietary habits	50 (79.4 %)	4 (44.4 %)	54 (75.0 %)
Partner health	49 (77.8 %)	5 (55.6 %)	54 (75.0 %)
Age >36 years	46 (73.0 %)	7 (77.8 %)	53 (73.6 %)
Blood pressure	41 (65.1 %)	8 (88.9 %)	49 (68.1 %)
Being underweight	43 (68.3 %)	6 (66.7 %)	49 (68.1 %)
Work with toxic substances/radiation	44 (69.8 %)	3 (33.3 %)	47 (65.3 %)
Infection prevention	43 (68.3 %)	2 (22.2 %)	45 (62.5 %)
Consanguinity	40 (63.5 %)	4 (44.4 %)	44 (61.1 %)
Eating disorder	37 (58.7 %)	3 (33.3 %)	40 (55.6 %)
STDs	36 (57.1 %)	3 (33.3 %)	39 (54.2 %)
Work load	33 (52.4 %)	3 (33.3 %)	36 (50.0 %)
Partner involvement	30 (47.6 %)	4 (44.4 %)	34 (47.2 %)
Stress	32 (50.8 %)	2 (22.2 %)	34 (47.2 %)
Ethnicity	29 (46.0 %)	4 (44.4 %)	33 (45.8 %)
Over-the-counter medication	28 (44.4 %)	4 (44.4 %)	32 (44.4 %)
Cervix cytology abnormalities	24 (38.1 %)	4 (44.4 %)	28 (38.9 %)
Uterine anomalies	20 (31.7 %)	6 (66.7 %)	26 (36.1 %)
Rubella vaccination	21 (33.3 %)	1 (11.1 %)	22 (30.6 %)
Household work with toxic substances	17 (27.0 %)	1 (11.1 %)	18 (25.0 %)
Travel	9 (14.3 %)	0 (0 %)	9 (12.5 %)

Literature

Literature about the current practice of PCC is scarce. We based our questionnaire on the questionnaire used in a previous study carried out in 2016 by van Voorst et al. (2016). In general, the current practice of PCC is very similar to the practice described earlier by van Voorst et al. (2016). The perceptions of healthcare professionals about PCC are

positive, but the uptake is still low. Increasing the uptake and extending delivery of PCC and standardizing PCC should still be an important goal. The low uptake of PCC may be due to women's lack of knowledge regarding PCC, as indicated by the review of Steel et al. (2016). This issue is also highlighted in an interview study by Ismaili M'hamdi et al. (2017), which identifies barriers to the uptake and delivery of PCC.

Practice

It is likely that PCC provided by independent primary care midwives differs from PCC provided by obstetricians or clinical midwives in a hospital, due to the differences in population. For example, chronically ill women who wish to have a child are often referred to an obstetrician who then assesses possible risk factors and adequately manages the woman's condition prior to, during, and after pregnancy. Independent midwives more often provide PCC for parents-to-be from the general population and refer to an obstetrician or general practitioner if they identify a medical risk factor that requires additional care. The number of obstetricians that participated in our study in our study was too small to make a good comparison between independent midwives and obstetricians.

Furthermore, younger birth care professionals may have different perceptions and practices than those of older birth care professionals as a result of changes in the study curricula and growing awareness of the need for PCC. Unfortunately, the number of respondents was too small to further investigate this topic.

Timing of PCC

Many respondents indicated that they usually provide PCC in the postpartum period. This is understandable, as this is often the last time a woman is seen by her birth care provider before a new pregnancy occurs. We consider this to be *interconceptional* advice. If the postpartum period is the only way of delivering non-requested PCC, firstborns and their mothers miss out on the benefits on PCC. Furthermore, a final consultation does not always allow discussing successive pregnancies, as time may be limited and the woman may not feel open to discuss having another baby. Additionally, mothers often visit the postpartum check-up alone, while PCC is a topic that explicitly concerns both parents-to-be. Finding ways of increasing the uptake of PCC by couples who wish to become pregnant of their first child seems warranted.

Use of protocol

Quite a few birth care providers indicated that they do not utilize a protocol or other tools to detect possible risk factors. It is interesting to extend the population and perhaps interview various birth care providers on their considerations whether to use a protocol or not. Remarkably, five obstetricians stated to not use a protocol even though most hospital bound care is protocolized. It would be interesting to study the differences in organization and practice between protocol-driven PCC and non-protocol-driven PCC, especially concerning the identification of risk factors for adverse pregnancy outcomes and couples' satisfaction regarding their PCC consultation. We have identified great differences in the risk factors evaluated by birth care professionals. In our study, none of the respondents indicated to inquiring about all possible risk factors. Again, possible differences between primary midwifery care and secondary and tertiary obstetric care may be of influence with regard to risk factor assessment.

Of the 32 respondents who use protocols and tools, 23 referred to 'Pregnant Wiser', versus 3 who referred to the PIL. 'Pregnant Wiser' is a digital questionnaire to identify risk factors, while the PIL is a summarization of what PCC entails and states the working agreements between birth care disciplines. The difference in use is striking, given that the PIL is a guideline crafted by multiple birth care disciplines, an approach which usually leads to widespread support. One explanation might be

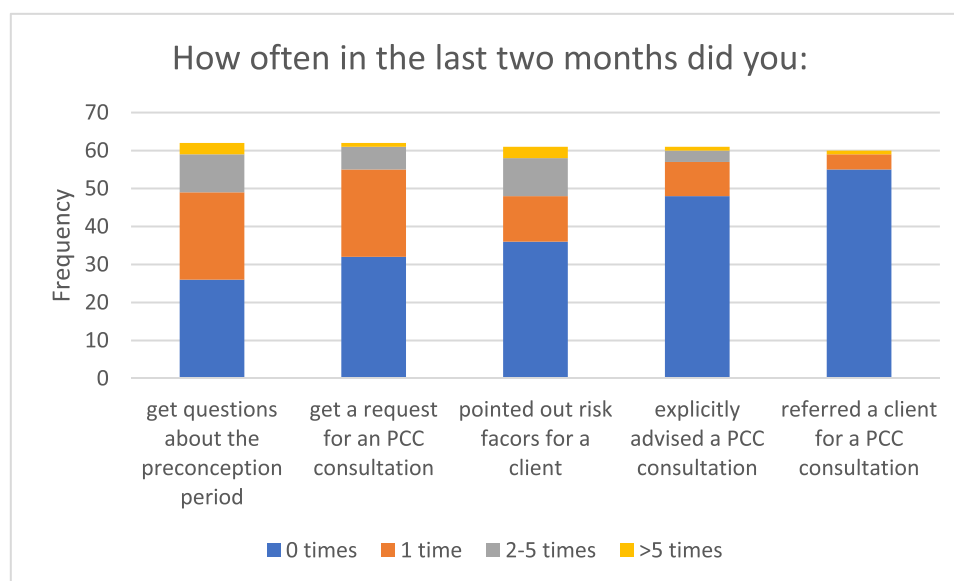


Fig. 1a. Frequency of questions, requests, and consultations regarding preconception care among primary care midwives.

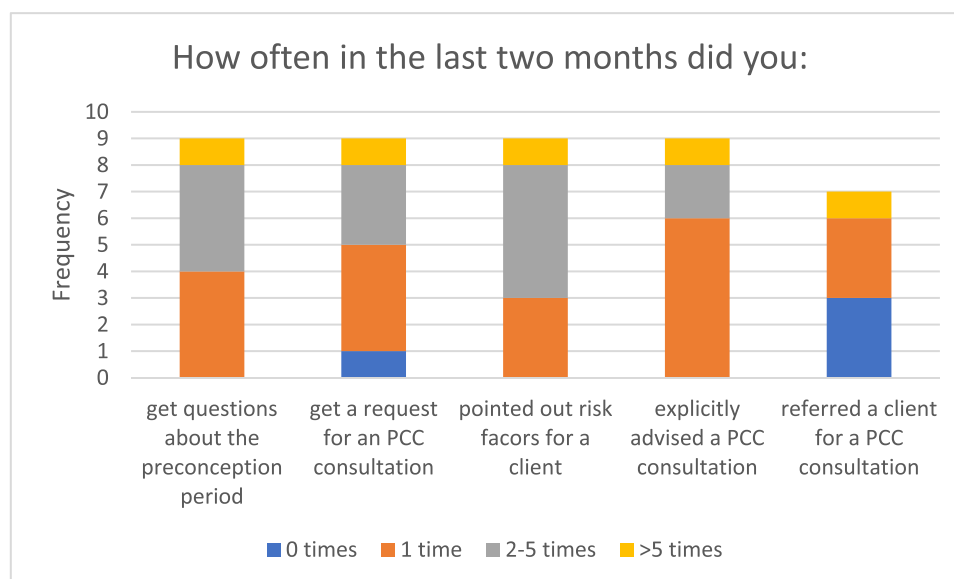


Fig. 1b. Frequency of questions, requests, and consultations regarding preconception care among obstetricians.

the fact that 'Pregnant Wiser' provides subsequent actions per detected risk factor, in a clear and simple way, and can be filled in and emailed to the birth care provider by the parents-to-be themselves, prior to the consultation. This saves precious time and offers the birth care provider the opportunity to determine the course of the consultation prior to the appointment.

Strengths & limitations

One of the strengths of our study is the high response rate of 83/102 (81.4 %). We take into account, however, that only one birth care professional per organization filled in the questionnaire. It is likely that this was the professional with the strongest affinity to PCC. This could have influenced the responses to questions about perceptions of PCC.

Although we had a high response, it is likely that the invited birth care professionals who did not provide PCC were less inclined to fill in the questionnaire, which may have resulted in an overestimation of the

proportion of birth care providers who provide PCC. We did try to diminish this bias by asking by phone everyone who had not responded after the second reminder to participate, irrespective of whether they provided PCC or not.

Another limitation of this study is the low number of included obstetricians. In the Netherlands, there are far more independent midwifery practices in a region than there are hospitals with obstetric departments. So, although all the obstetric departments in the South-west region of the Netherlands are invited, the number is still low. This makes the comparison between PCC provided by midwives and obstetricians difficult.

Lastly, the questionnaire used for this article has not been validated. However, it was based on the questionnaire used by van Voorst et al. for previous research on this topic. Furthermore, we consulted birth care professionals and both experts and non-experts in the field of PCC to evaluate the adaptations of the questionnaire.

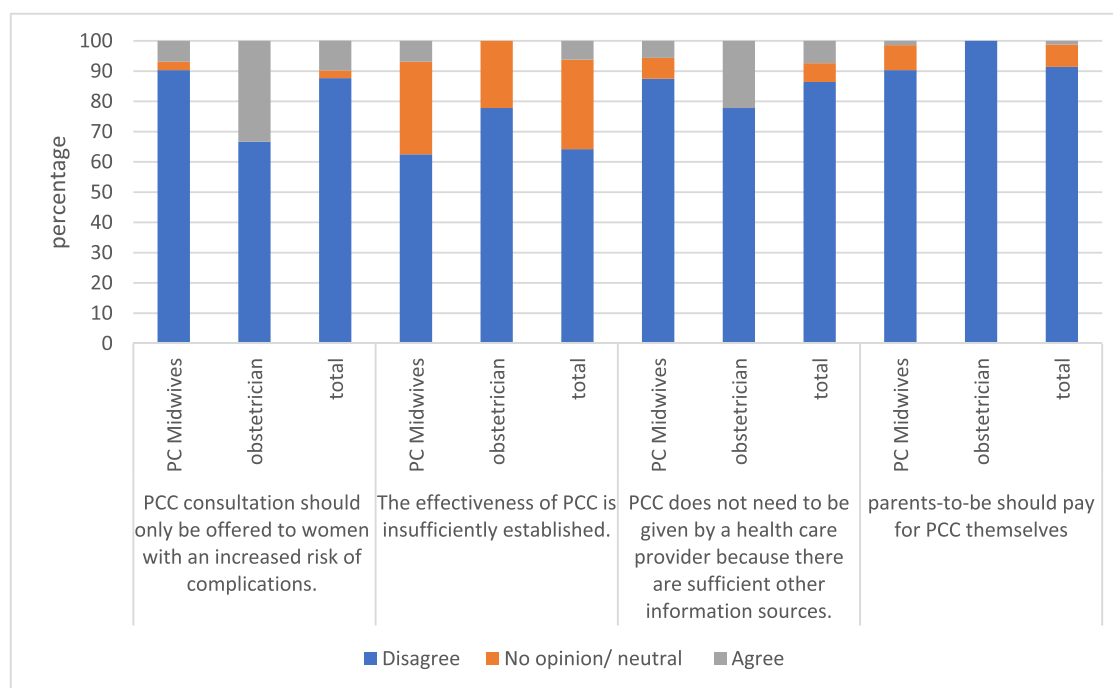


Fig. 2. Perceptions of the respondents regarding PCC.

Implications for future

In the future, the practice of PCC needs to become more commonplace among birth care providers, as well as among couples who wish to become pregnant.

Conclusion

Most of the respondents in this study provided PCC, most often through an individual consultation offering personalized health and lifestyle advice. The identification of risk factors however differs greatly. Furthermore, to increase the awareness and (thereby) demand for and uptake of PCC, it would be prudent to promote the use of widespread, standardized protocols for general PCC, as well as specialized PCC and to investigate the considerations of birth care providers whether to use a protocol for PCC. It would also be interesting to research the differences between PCC provided by primary care midwives and obstetricians.

Ethical approval

Not Applicable

Funding sources

This study was part of two studies funded by ZonMw:

- A loyalty program to motivate vulnerable women to engage in pre-conception care: 'from voucher to tablet' (project number 543003103)
- Influence of maternal preconception and early-pregnancy health on pregnancy and offspring outcomes. From risk selection to interventions in multi-ethnic populations (project number: 543003109)

Clinical trial registry and registration number

Not applicable

CRedit authorship contribution statement

J. Scheele: Conceptualization, Methodology, Formal analysis, Resources, Writing – review & editing, Visualization, Project administration. **S.M. Smith:** Conceptualization, Methodology, Writing – review & editing. **R.J. Wahab:** Conceptualization, Methodology, Writing – review & editing. **B. Bais:** Conceptualization, Methodology, Writing – review & editing. **R.P.M. Steegers-Theunissen:** Conceptualization, Methodology, Writing – review & editing, Funding acquisition. **R. Gaillard:** Conceptualization, Methodology, Writing – review & editing, Funding acquisition. **H.W. Harmsen van der Vliet - Torij:** Conceptualization, Methodology, Resources, Writing – review & editing, Supervision.

Declaration of Competing Interest

None declared

Acknowledgments

We thank the participants of the study: all primary care midwives and obstetricians who filled in the questionnaire. This study is part of two research project which were partially funded by ZonMw (grant number 543003103 and 543003109).

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.midw.2023.103855](https://doi.org/10.1016/j.midw.2023.103855).

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