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Erasmus MC
Universitair Medisch Centrum Rotterdam

Integrating interconception care in Preventive Child Health Care services: the Healthy Pregnancy 4 All Program

Sijpkens MK
Lagendijk J
van Minde MRC
Bertens LCM
Rosman AN
Steegers EAP

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Erasmus University Rotterdam

ABSTRACT

Background: Most parents with young children pay routine visits to Well-Baby Clinics, or so-called Preventive Child Health Care (PCHC) services. This offers a unique opportunity to promote and deliver interconception care. This study aimed to integrate such care and perform an implementation evaluation.

Methods: In seven Dutch municipalities, PCHC professionals were instructed to discuss the possibility of an interconception care consultation during each routine six-months well-baby visit. The primary outcome of this study was coverage of the intervention, quantified as the proportion of visits during which women were informed about interconception care. Secondary outcomes included adoption, fidelity, feasibility, appropriateness, acceptability and effectiveness of the intervention, studied by surveying PCHC professionals and women considering becoming pregnant.

Results: The possibility of interconception care was discussed during 29% (n=1,849) of all visits, and 60% of the PCHC physicians adopted the promotion of interconception care by regularly informing women. About half of the PCHC professionals and most women judged integration of interconception care in PCHC appropriate and acceptable. Estimated feasibility was poor, since 13% of the professionals judged future integration in daily practice as probable. The uptake of interconception care consultations was low (n=4 consultations).

Conclusions: Promotion of interconception care was achieved in approximately one-third of the routine PCHC consultations and appeared promising with regards to adoption, appropriateness and acceptability. However, concerns on feasibility and uptake of interconception care consultations in daily practice remain. Suggestions for improvement may include further integration of interconception care health promotion in routine PCHC consultations, while allocating sufficient resources.

INTRODUCTION

Well-Baby Clinics, otherwise known as Preventive Child Health Care (PCHC, box 1) services, provide unique access to women between pregnancies. Most women with young children go to routinely scheduled PCHC appointments, which offers an opportunity for interconception care (ICC). ICC is a form of preconception care (PCC) between pregnancies, aiming to optimize parental health prior to pregnancy.[1] Currently, antenatal care usually starts too late to prevent that risk factors for adverse pregnancy outcomes affect the periconception period.[2, 3] Many periconception risk factors are associated with the course of pregnancy and with child health outcomes,[4-6] including behavioral, medical, and psychosocial risks.[7] These risk factors are frequent among women who may become pregnant, and certain groups of women in particular, need extra attention in preventive preconception strategies.[8, 9] For instance, large socio-economic inequalities exist in prevalence of risk factors such as smoking and inadequate folic acid intake.[8, 10-12] In addition, some studies suggest that these specific risk factors are also more prevalent in parous women.[13, 14] Besides, parous women may exhibit risks for recurrence of adverse pregnancy outcomes, such as preterm birth and fetal growth restriction. ICC could address all these risks, but delivery and uptake of both PCC and ICC remain uncommon.[15, 16]

The idea that PCHC providers could contribute to the provision of ICC has been previously recognized in an advisory report on preconception care drafted by the Health Council of the Netherlands.[17] Until recently, a few promising ICC intervention studies focusing on folic acid supplementation were conducted in both Dutch and international PCHC settings.[18, 19] But to our knowledge, strategies to integrate more comprehensive ICC in PCHC are uncommon. We hypothesized that PCHC providers could promote and deliver comprehensive ICC consultations to increase the uptake of ICC and to improve preconceptional health. To understand how ICC could work in the real time practice of PCHC, implementation research is essential.[20] This study aimed to implement and evaluate promotion and delivery of ICC in PCHC centers in the Netherlands.

METHODS

Setting

The study was embedded in the HP4All-2 program.[21] The HP4All programs aim to improve maternal and perinatal health by enhancing risk-guided care from the preconception period through to the interconception period.[21, 22] In the preceding HP4All-1 program, recruitment for and delivery of PCC at general practitioners (GPs) and midwifery practices was employed, which included some PCHC services distributing information leaflets about PCC.[23, 24] The HP4All-2 program focused specifically on ICC. Both programs intended to reduce perinatal health inequali-

ties by focusing on municipalities with higher rates of adverse pregnancy outcomes than the national average.[21, 22] The current study was conducted in seven municipalities where, together with local government representatives, cooperation was sought with the PCHC services (box 1).[21]

The organization of Preventive Child Health Care (PCHC) in the Netherlands has some distinct characteristics.[25-27] It is organized nationally, but formalized on the municipal level. PCHC teams, consisting of trained physicians and nurses, monitor and promote optimal growth and development of the child by providing immunizations, screenings and health advice. If needed, they refer directly to general practitioners or pediatricians. PCHC is offered free of charge to all children from birth until the age of nineteen years. The care for children up to the age of four years is organized along a standard set of consultations in local well-baby clinics, which have high (>95%) attendance rates.[18]

Box 1: Preventive Child Health Care in the Netherlands

Intervention

The ICC intervention consisted of two-parts (Fig 1), of which the first part was applied in one manner to all seven municipalities, while the second part could differ per municipality. In the first part of the intervention, we integrated promotion of ICC in routine well-baby consultations at the child's age of six months, referred to as the 'six-months consultation'. Promotion consisted of the PCHC physicians screening the mother for her intention to become pregnant in the future, while discussing the possibility of a separate ICC consultation. In addition, when women considered becoming pregnant, they were screened for the following reasons to direct these women to an ICC consultation at short notice: 1) currently trying to become pregnant, and 2) an obstetrical history of an adverse perinatal outcome (e.g. preterm birth). Following the promotion of ICC, women could themselves make an appointment for an ICC consultation. For the delivery of these ICC consultations, constituting the second part of the intervention, two different approaches were implemented (Fig 1): in three out of seven participating municipalities PCHC professionals provided ICC consultations themselves; in the other four municipalities PCHC teams referred to a GP or community midwife for an ICC consultation.

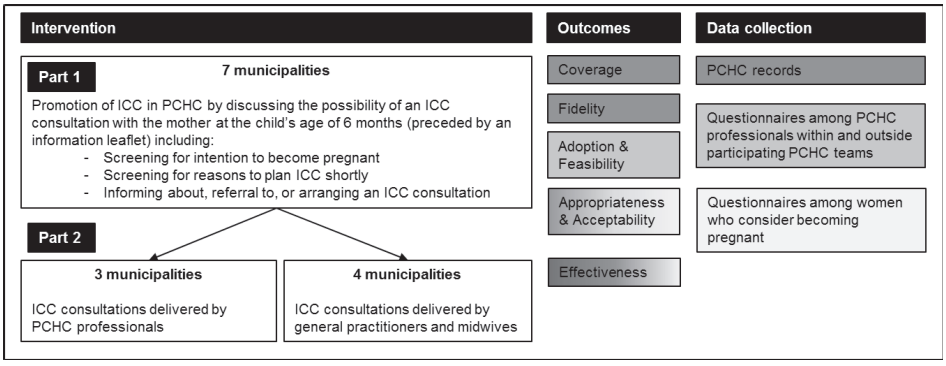

Fig 1. Outline of the study

Implementation strategy

In preparation of the implementation of the intervention, an analysis of its possible determinants was performed based on focus group discussions with various stakeholders (i.e. PCHC physicians, PCHC nurses, pediatricians, gynecologists, midwives, GPs, and policymakers).[28] An important expected barrier was the anticipated unfamiliarity with ICC among PCHC professionals and the target group of women who consider becoming pregnant again.[28] Therefore, prior to the delivery of our intervention, we provided several educational sessions and supporting materials. The educational sessions, offered to PCHC teams in all municipalities, consisted of a theoretical background lecture on the importance of ICC, and an interactive session with skills training in discussing ICC and pregnancy intention. In a separate session, the logistics of the study were explained. Supporting materials included information on ICC for the healthcare professionals, as well as information leaflets for women about ICC and what they could expect at the routine six-months consultation. In addition to the provided materials by our research team, one municipality developed a short promotional video, of which the link was sent to women who indicated to consider becoming pregnant. Lastly, during the project, one or two evaluation sessions were planned per PCHC team.

Participants

The main targets of the intervention were PCHC professionals and women who may become pregnant again. We have studied the integration of ICC in PCHC in both professionals and women.

The integration of ICC among PCHC professionals was studied in two subgroups. The first subgroup consisted of all PCHC physicians and nurses from the teams that were involved in the intervention; and the second consisted of a corresponding number of PCHC physicians and nurses from teams that were not involved in the HP4All programs, serving as a reference group.

All women who visited PCHC teams involved in the HP4All-2 program for the six-months consultation were eligible for the intervention. Additionally, in the first four municipalities that started the intervention (i.e. two of each ICC delivery approach; Fig 1), women who considered becoming pregnant were invited to participate in a questionnaire study if they met the inclusion criteria (i.e. age >18 years and sufficient understanding of the Dutch or English language).

Outcomes

An overview of all outcome measures is presented in S1 Table. The primary outcome of the study was *coverage* of the intervention, defined as the percentage of regular PCHC six-months consultations in which the possibility of an ICC consultation was discussed.[20] Secondary outcomes included the following other implementation outcomes: *Fidelity*, that is, adherence to screening for future pregnancy intention and specific reasons for short-term ICC, as well as

what action was taken per six-months consultation in which ICC was discussed); *Adoption*, defined as the uptake of discussing ICC measured among PCHC professionals*; Feasibility*, referred to as the expected possibility of ICC integration in PCHC among professionals*; Appropriateness*, being the desirability of ICC in PCHC among professionals and women; and *Acceptability*, that is, the agreeability on aspects of ICC in PCHC among professionals and women.[20, 29] Lastly, the *effectiveness* of the intervention was studied as the uptake (i.e. the number) of separate ICC consultations.

Data collection

Data were collected at three levels (Fig 1): data from records kept at each PCHC well-baby clinic, questionnaires filled out by PCHC professionals and questionnaires filled out by participating women who considered becoming pregnant. From the different ways of data collection that were used, all items on the implementation outcomes are outlined in detail in S1 Table.

PCHC records were used to collect data on coverage: the total number of six-months consultations and whether during these consultations ICC was discussed. In addition, data about specific findings during this discussion (i.e. pregnancy intention and actions taken; referred to as fidelity) and certain background characteristics (i.e. age, ethnicity, parity, and 4-digit postal code to determine neighborhood deprivation 'yes'/'no' as previously defined[30]) were collected if women gave consent. The uptake of ICC consultations was also registered through PCHC records. The data from PCHC records was either extracted from PCHC electronic records or took complementary place on paper (i.e. in case integration of data collection of ICC items was not possible in the electronic records). It was then anonymized and transferred into a Generic Medical Survey Tracking system called Gemstracker (https://gemstracker.org/general-information).

The questionnaire for PCHC professionals was similar for both subgroups of PCHC teams participating and not-participating in the intervention. It contained data on participation in ICC (i.e. adoption), determinants of implementation as developed in previous studies (i.e. feasibility, appropriateness, and acceptability),[31] and background characteristics (e.g. age, work experience).

The professionals participating in the intervention were requested to respond to the digital questionnaire twice: once three months into the intervention and again at the end of the intervention period. At one single point of time during the program, non-participating PCHC teams from different municipalities were requested to respond to the digital questionnaire.

Participating women received two digital questionnaires. The first questionnaire, sent directly after inclusion, consisted of background characteristics (i.e. age, ethnicity, educational attain-

ment, number of children, income, civil status), medical and obstetrical history, and lifestyle behaviors. In addition, their opinion on two statements regarding appropriateness and acceptability of ICC was asked. In the second questionnaire, sent six months later, the uptake of ICC (i.e. effectiveness) was assessed.

The intervention and data collection started in alignment with preferences of each municipality. The first municipality started data collection in December 2015; the last municipality started in September 2016. The intervention lasted up to and including February 2017.

Data analyses

Descriptive statistics were performed to describe background characteristics of the municipal PCHC services, the PCHC professionals participating in the questionnaire study and the participating women. Frequencies and percentages were used to describe the implementation outcomes. In describing the coverage, we also showed minimum and maximum values over the different municipalities and presented the results per ICC delivery approach (i.e. PCHC or GPs and midwives; Fig 1). With respect to acceptability by PCHC professionals, we used a composite outcome based on the eight different questionnaire items (S1 Table) and determined both the median score and the percentage of professionals that based on the composite score agreed with the items (i.e. average ≥3.5; range 1-5). For the composite outcome we calculated the Cronbach's alpha to assess the internal consistency of items. Data analyses were performed with SPSS Statistics (version 21).

Ethics approval and consent to participate

The study was reviewed by the Daily Board of the Medical Ethics Committee Erasmus MC in the Netherlands (MEC-2015-182). As a result of this review, the Board declared that the rules laid down in the Medical Research Involving Human Subjects Act (also known by its Dutch abbreviation WMO) do not apply to the study. Written informed consent was obtained from the women who participated in the questionnaire study.

RESULTS

Organizational level

Organizational characteristics

The intervention period ranged from six to thirteen months per municipality. A total of 21 teams were trained at the beginning of the study and a total of 20 PCHC teams participated in the intervention throughout the study (Fig 2), ranging from one to ten per municipality. One trained PCHC-team did not start the intervention due to being understaffed because of sick

leave. The number of PCHC professionals involved was 112 and varied per municipality from 3 to 28. In total, 6,321 six-months consultations took place during the study period (ranging from 192 to 1,726 per municipality).

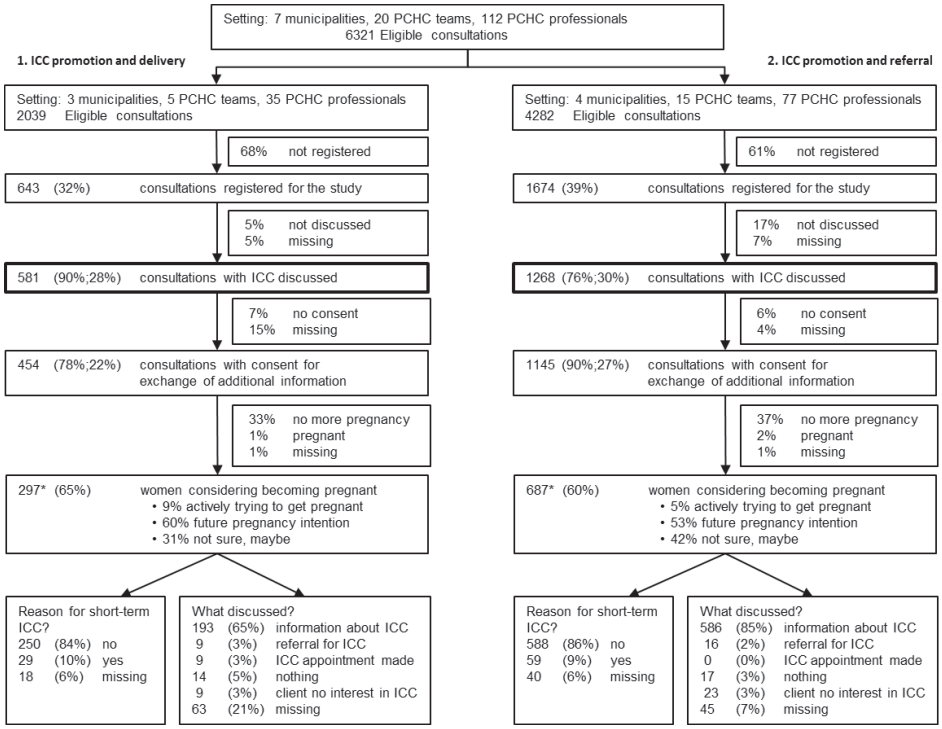

Fig 2. Overview of ICC implementation (coverage and fidelity) by ICC delivery approach
(% ; %): first % refers to the total number in de line above, the second % refers to the absolute total number of consultations.
*Total number of women considering a pregnancy is 984 (297+687).

Coverage, fidelity, and effectiveness

ICC was discussed in 1,849 consultations and as such the coverage of our intervention was 29% of the total amount of six-months consultations. The coverage did not differ per delivery approach (Fig 2), but did vary between 12% and 55% per municipality. Additional characteristics were available for 86% (n=1,599) of the women reached; 62% (n=984) of these women considered becoming pregnant again. Of these 984 women, the median age was 30 years (min-max: 16-43 years), 32% did not consider themselves of Dutch background, 19% lived in a deprived neighborhood, and 40% were multiparous.

In addition, PCHC professionals identified reasons for short-term ICC, which meant either already trying to get pregnant or having an obstetrical history of an adverse perinatal outcome, in 10% of these 984 women. Professionals' actions consisted of information provision about ICC in 80% of the 984 women. In only one municipality, professionals not only provided information,

but also proactively made nine separate ICC appointments for their clients, of which four ICC consultations actually took place.

PCHC professional level

Characteristics of the professionals

Of the total number of participating PCHC professionals (n=112), 70% (n=78) responded to the first questionnaire (Q1). At the time of the second questionnaire (Q2), 99 (88%) professionals were still working in the participating teams and 66% (n=65) of these professionals responded. Professionals from all seven municipalities were represented in the responses to both questionnaires. The questionnaire to non-participating teams was sent to 394 professionals, of which 116 (29%) responded. After excluding professionals who reported awareness of the HP4All program, 91 (78%) questionnaires were available.

Baseline characteristics of the PCHC professionals who responded to the questionnaires are presented in table 1. Relatively more PCHC nurses than physicians replied to the questionnaire in the non-participating teams (74%) than in the participating teams (54%).

Adoption, feasibility, appropriateness, and acceptability

The implementation outcomes based on the three questionnaires among PCHC professionals are presented in table 1. At the end of the study period (Q2), adoption of regularly informing clients about ICC was 46.9% overall. This was even higher among the 30 physicians (60.0%), who usually provide the six-months PCHC consultation. These physicians selected the following reasons for not discussing ICC most often: 'not enough time due to other tasks' (63.3%), 'difficult communication' (50%), and 'I forgot' (46.7%). With regards to possible suggested forms of ICC, the physicians agreed with the following forms of ICC most often: 'providing information materials' (83.3%), 'discussing referral for ICC at GPs or midwives' (67.7%), 'providing general advice during routine PCHC visits' (60.0%), and 'screening for risk factors and discussing these during routine visits' (46.7%). They agreed least often with 'Performing an actual ICC consultation' (23.3%).

Feasibility, appropriateness, and acceptability were similar in participating and non-participating PCHC teams (table 1). Feasibility was considerably lower than appropriateness and acceptability (table 1). In all groups, the majority was unsure about the feasibility (range 68.8-79.1%) and 3.9-11.0% expected integration of ICC in PHCH not to be feasible. The reported explanations for expected low feasibility were 'not enough resources' (i.e. time and financial compensation) and 'dependence on prioritizations of the PCHC organization and municipality', while 'sufficient training' was mentioned as a requirement. With regards to appropriateness, some professionals were unsure and mentioned that ICC 'does not fit in the current tasks of PCHC' and 'might

be more suitable for GPs and midwives', and that they 'expected little interest from the target group'. However, most explanations for appropriateness were along the lines that ICC in PCHC is 'relevant' (i.e. importance of prevention, reproductive planning, and reaching vulnerable groups) and 'suitable' within the preventive tasks and reach of PCHC. Regarding acceptability, very few professionals disagreed with the statement that 'it is important to contribute to ICC' (Q1: 1.3%, Q2: 1.7%, and non-participating teams: 7.8%).

Table 1. Characteristics and implementation outcomes of PCHC professionals in participating and non-participating teams

Characteristics and implementation outcomes of PCHC professionals	Participating team Q1 N = 78		Participating team Q2 N = 65		Non-participating team N = 91	
Age (years)	45.0	22 - 66	46.0	22- 66	44.0	21- 64
Profession						
physician	36	46.2%	30	46.2%	24	26.4%
nurse	42	53.8%	35	53.9%	67	73.6%
Work experience in current function (years)	9.0	1 – 37	10.0	1 – 35	9.0	0 – 35
Received training about ICC (yes)	62	79.5%	NA	NA	3	3.3%
How well-informed about ICC (well)	NA	NA	41	63.1%	4	4.4%
Adoption: Attention to promotion or delivery of ICC (quite some – a lot)	NA	NA	36	56.3%	14	15.4%
Adoption: Asking about intention to become pregnant (≥ 50% women)	31	41.3%	25	39.1%	7	7.7%
Adoption: Informing clients about ICC in case of known future pregnancy intention (≥ 50% women)	30	39.5%	30	46.9%	3	3.3%
Feasibility: ICC in PCHC probable (yes)*	21	27.3%	8	12.5%	11	12.1%
Appropriateness: ICC in PCHC desirable (yes)*	35	44.9%	30	46.9%	41	45.1%
Acceptability: Important to contribute to ICC (agree)**	48	61.5%	31	53.4%[1]	48	53.3%
Acceptability: Composite statement outcome (agree)**	31	39.7%	21	36.2%[1]	33	36.7%
Acceptability: Composite statement outcome (median) ***	3.38	2.5-5.0	3.31	2.4-4.8[1]	3.25	2.0-4.4

Median, min – max or numbers and percentages of non-missing cases. Missing value <5% unless otherwise stated.
NA: Not available.
* Instead of 'maybe' or 'no'.
** Instead of neutral ' or 'disagree'
*** Possible scores ranged from 1-5.
[1] Missings > 5% (10.8%)

Level of participating women

Characteristics of the participants

Of the 984 women who considered a future pregnancy (Fig 2*), 793 women were eligible to participate in our study (Fig 3). In total, 385 women (49%) consented to participate in the

study, of whom 170 (44%) responded to the first questionnaire and 149 (37%) responded to the second questionnaire. Baseline characteristics of the participants are displayed in S2 Table. It shows the prevalence of potential interconceptional risk factors for adverse pregnancy outcomes, such as a complicated obstetric history (23.7%) and no preconceptional folic acid supplementation before a previous pregnancy (31.1%).

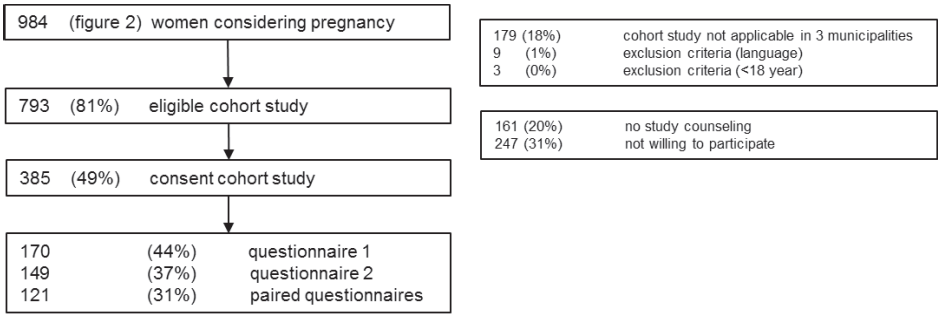

Fig 3. Flowchart of participants (women) in the study

Appropriateness, acceptability, and effectiveness

In questionnaire 1, with regards to appropriateness, most women (n=129, 94.2% of available responses) agreed to the statement "I should receive information about ICC via well-baby clinics". With respect to acceptability, the majority (n=93, 66.4%) also agreed to the statement: "I find it acceptable that I was asked whether I consider becoming pregnant again", whereas 4.2% disagreed and 29.3% was neutral.

In the second (follow-up) questionnaire, only one woman reported to have had an ICC consultation (effectiveness). To the question whether women considered making use of an ICC consultation in the future, two women (1.4%) replied "Yes", 55 women (38.7%) "Maybe", and 85 women (59.9%) "No". When participants were asked about their reasons for not planning an ICC consultation, the following reasons were reported (n=70): 55.7% "was not convinced about the benefit"; 31.4% "did not know what it would entail"; 8.6% "was unable to go to an appointment"; and in 4.3% the "partner did not consider it to be necessary".

DISCUSSION

Principal findings

This study has shown that it seems possible to promote ICC in PCHC, but at the same time it has illustrated that delivery of actual ICC in daily practice is challenging. After introducing the intervention, PCHC physicians discussed the possibility of an ICC consultation with mothers in about a third of the routine PCHC visits at the child's age of six months. Promising is that the

majority of PCHC physicians adopted the promotion of ICC and that many professionals judged integrating ICC in PCHC as appropriate and acceptable. However, even in the best performing municipality coverage did not exceed 55%, showing room for improvement. Possibly, either the urgency of promoting ICC was not conveyed enough or feasibility concerns related to lack of time could not be solved. This shows, together with low uptake of ICC among women, the challenge of delivering ICC. Although women were positive with regards to being informed about ICC, they could not be convinced to make an appointment for an ICC consultation.

Comparison to literature

The field of implementation research is increasingly acknowledged in its attempt to optimize the translation of evidence-based insights into practice.[20, 32] Implementation research may provide valuable insights with regards to PCC and ICC, since daily practice is still uncommon. One study based on implementation outcomes has recently suggested that the possibility of integrating a simple general preventive screening intervention for healthy lifestyles in primary care is promising.[33] This study showed higher overall coverage (52%) and adoption rates (75%) than our study.[33] More specifically for PCC and ICC, a few studies have already shown that acceptability of pregnancy intention screening in primary care is high.[34, 35] As such, screening pregnancy intention in primary care has been advocated as a strategy to promote both preconception care as well as contraceptive care for women.[36]

However, with regards to the effectiveness of such screening on uptake of care, little remains known.[34]

In our study, uptake of ICC was low as only few women had an appointment for an ICC consultation. Appointments only occurred in one municipality where the PCHC professionals pro-actively arranged it. Women themselves did not seem to make ICC appointments and they reported a low need and unfamiliarity with ICC as barriers for making an appointment. These barriers for uptake of ICC have been recognized as important barriers before.[37] Even though the aim of our intervention was to overcome these barriers by promotion of ICC by PCHC professionals, it appeared not to be enough to substantially improve the uptake of ICC.

Possibly, ICC could become more common by further integration of general ICC health promotion within routine care provided by PCHC teams. It would diminish the currently found barrier among women of organizing a separate appointment and could also reduce the barriers among professionals when this routine care would be sufficiently compensated. At the same time, the acceptability among both groups seemed to be good with regards to integration of ICC topics in routine care. While a separate ICC consultation with other professionals such as GPs, midwives, or gynecologists could still be an opportunity in case of detected higher risk for adverse pregnancy outcomes, awareness of certain ICC topics among professionals and

women would at least be secured. For instance, other studies focusing on the promotion of folic acid supplementation in routine PCHC practice have shown promising results with regards to increased use and intention.[18, 19] Other encouraging, recently reported, ICC related practices that were aimed at mothers during well-child visits, include screening and addressing tobacco use, depression risk and contraception use.[38, 39] As such, standardization of certain ICC items in PCHC could make it accessible for all women while warranting sufficient management support and resources, which could improve feasibility.

Strengths and limitations

Strengths of this study are introducing the ICC intervention in the real-time practice of PCHC, including training of professionals, and evaluating this intervention in a comprehensive way. We included data from different sources, representing different stakeholders, which contributed to such comprehensive evaluation, as has been suggested for implementation research.[20, 29, 32] Our study also has some limitations. Firstly, the implementation outcomes costs and sustainability were not included in our study. Secondly, we only measured limited effectiveness of our intervention on uptake of ICC and we could not measure the effectiveness on health outcomes. Thirdly, a selection bias may have occurred in participating professionals and women with regards to their opinion on ICC, since participation rates in some of the questionnaires were rather low. Also, registration in the PCHC records seemed often only performed in case ICC was discussed and hence certain study outcomes were only available in 37% of the total six-months consultations. Lastly, municipal differences in for instance management involvement, time constraints, staffing issues, and other context factors such as restructuring PCHC, likely influenced differences between municipalities, but separate analyses on these factors were outside the scope of this study.

CONCLUSION

Only promoting ICC in routine PCHC visits, which was achieved in 29%, is likely not enough to reach women with ICC. Suggestions for improvement include further integration of ICC health promotion in routine PCHC consultations, while allocating sufficient resources (e.g. time, financial compensation and training) to increase feasibility. These possibilities are worthwhile to further investigate, given the unique opportunity of PCHC services to access women of reproductive age with preventive ICC.

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1. Outline of implementation outcomes as derived from the questionnaires

Outcomes	Data collection /source	Items	Response categories	Scoring / reporting
Coverage	PCHC records	Was the possibility of ICC discussed?	Yes – no – unknown/missing	% yes
Fidelity	PCHC records	Screening for intention to become pregnant?	Actively trying to become pregnant – future pregnancy intention – not sure yet, maybe – currently pregnant – no more pregnancy intention – unknown/missing	% response to answer categories
		In case of possible pregnancy intention; reasons for short-term ICC (e.g. actively trying to become pregnant or obstetrical history of adverse pregnancy outcome)	Yes – no – unknown/missing	% response to answer categories
		In case of possible pregnancy intention, what action was taken during the six-month consultation?	Just information provision about ICC – referral for ICC – ICC appointment made – nothing – client had no interest – unknown/missing	% response to answer categories
Adoption	PCHC provider questionnaires (2/3)[a]	How much attention do you pay to providing ICC?	very little - little - not little / not much - much - very much	not little / not much - much - very much
	PCHC provider questionnaires	With how many women do you discuss whether she intends/considers to become pregnant again?	none - a minority - half - a majority - everyone	≥ 50% women
		With how many women do you discuss the possibility of an ICC consultation?	none - a minority - half - a majority - everyone	≥ 50% women
	PCHC provider questionnaires (1/3)[b]	In case you are not able to discuss ICC, what was the main reason?	Lack of time due to my other tasks Lack of time due to late arrival of the client I experience not enough expertise I do not consider it my task It feels not right due to circumstances of the client The client does not want to discuss it Difficult communication (e.g. language barrier I forgot Other reason	Multiple answers possible, reported if >33% responses
Feasibility	PCHC provider questionnaires	Do you expect that ICC will actually be integrated in PCHC in the future?	very certainly not - certainly not - maybe not/yes - certainly yes - very certainly yes	certainly yes - very certainly yes
		Explanation		Summary of responses
Appropriate-ness	PCHC provider questionnaires	Do you consider it desirable that ICC will actually be integrated in PCHC in the future?	very certainly not - certainly not - maybe not/yes - certainly yes - very certainly yes.	certainly yes - very certainly yes
		Explain		Summary of responses
		If ICC becomes integrated in PCHC, do you find these forms appropriate?[b] - providing information materials - providing general advice during routine PCHC visits - screening for risk factors and discussing these during routine visits - performing an actual ICC consultation - discussing referral for ICC at GPs or midwives	very certainly not - certainly not - maybe not/yes - certainly yes - very certainly yes.	certainly yes - very certainly yes.
	Participant Q1	How do you think that you should receive information about the existence of an ICC consultation?	"PCHC - well-baby" clinic could be selected	yes

1. Outline of implementation outcomes as derived from the questionnaires (*continued*)

Outcomes	Data collection /source	Items	Response categories	Scoring / reporting
Acceptability	PCHC provider questionnaires	ICC is as far as I know based on empirical evidence	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		ICC is in line with how I am used to work	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		I think it is important to contribute to ICC	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		I think it is my job to provide ICC	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		I have sufficient knowledge and skills to be able to provide ICC	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		I find interconception care suitable for my clients	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		I expect that clients will generally be satisfied if I provide ICC	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
		I expect that clients will generally cooperate if I provide ICC	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
	Participant Q1	I think that it is good that I was asked whether I consider becoming pregnant again	strongly disagree - disagree - neutral - agree - strongly agree	agree - strongly agree
Effectiveness	PCHC records and records from GP and midwifery practices	Registration of ICC consultations		Total number
	Participant Q2	Did you have an appointment for an ICC consultation?	yes - no	% response to answer categories
		Do you intend to have an ICC consultation in the future?	yes- maybe - no	% response to answer categories
		What was the most important reason for you to decide not to have an ICC consultation?	I dreaded having an appointment - I was not convinced about the benefit - I did not know what it would entail - I was unable to go to an appointment - I could not get an appointment with the healthcare provider that I wanted to visit - my partner did not consider it necessary	% response to answer categories

Questionnaires:

Participant Q1 + Q2. PCHC providers: Participating team Q1 + Q2 and Non-participating team Q1.

a. not participating team Q1

b. only participating team Q2

2. Characteristics of participants

Characteristics at baseline (Q1) N= 170 [a]		N	%
Age	Median age in years (min- max)	30.5	20-43
Ethnicity [b]	Dutch	133	85.3
	Other	23	14.7
	Missing	14	8.2
Educational attainment [c]	Low	6	3.9
	Intermediate	47	30.3
	High	102	65.8
	Missing	15	8.8
Pregnancy intention	Currently pregnant	1	0.7
	Within next 6 months	14	9.3
	Within next 6 - 12 months	23	15.2
	After > 12 months	78	51.6
	In doubt about becoming pregnant again	35	23.2
	Missing	19	11.2
How many living children	One child	124	81
	Missing	17	10
Paid job	Yes	136	87.7
	No	19	12.3
	Missing	15	8.8
Monthly household income	Low (<1500€)	7	4.1
	Middle (1500 - 3000€)	55	32.4
	High (>3000€)	91	53.5
	Missing	17	10.0
Civil status	Living together	148	96.1
	In a relationship, not living together	4	2.6
	Not in a relationship	2	1.3
	Missing	16	9.4
Obstetric history	Low birth weight baby (<2500gram)	13	9.4
	Child with congenital abnormalities	4	2.9
	Preterm birth (<37 weeks)	16	11.5
	Medical concerns of the neonate following birth	15	10.9
	Perinatal mortality	3	2.2
	Composite outcomes (1 of 5 outcomes above)	33	23.7
	Missing	33	19.4
Diabetes, hypertension or	Yes	15	10.7
pre-eclampsia	No	125	89.3
	Missing	30	17.6
Preconception lifestyle risks	No folic acid supplementation	132	86.8
	No folic acid before last pregnancy	46	31.1
	Smoking	15	9.8
	Alcohol consumption ≥ 1/week	104	68
	Illicit drug use	1	0.7
	Missing	18	10.6
Chronic medical condition	Yes	15	10.1
	No	134	89.9
	Missing	21	12.3
Contraception	Yes	115	76.2
	No	36	23.8
	Missing	19	11.2

a. Data are expressed as numbers and percentages of non-missing cases unless otherwise specified. Missing value percentage of total.
b. Self-defined ethnicity
c. Educational attainment level was defined as the highest completed educational level classified according to the International Standard Classification of Education (ISCED) i.e. low (level 0-2: early childhood; primary education; lower secondary education); intermediate (level 3-5: upper secondary; post-secondary; short cycle tertiary); and high (level 6-8: bachelor; master; doctoral). Unesco institute for statistics 2014.