

# Self-management support by health care providers in prenatal Shared Medical Appointments (CenteringPregnancy©) and prenatal individual appointments

Anna H.C. Tsiamparlis-Wildeboer<sup>a,b,c,\*</sup>, Esther I. Feijen-De Jong<sup>a,b,c</sup>, Mirjam T. van Lohuizen<sup>c</sup>, Elke Tichelman<sup>d,e</sup>, Ank de Jonge<sup>a,c</sup>, Fedde Scheele<sup>f,g</sup>

<sup>a</sup> Amsterdam UMC, Vrije Universiteit Amsterdam, Department of Midwifery Science, Amsterdam Public Health Research Institute, Amsterdam, the Netherlands

<sup>b</sup> University of Groningen, University Medical Center Groningen, Department of General Practice & Elderly Medicine, Groningen, the Netherlands

<sup>c</sup> AVAG (Academy Midwifery Amsterdam and Groningen), Groningen, the Netherlands

<sup>d</sup> School of Health Care Studies, Rotterdam University of Applied Sciences, department of Midwifery Education, the Netherlands

<sup>e</sup> Research Centre Innovations in Care, Rotterdam University of Applied Sciences, the Netherlands

<sup>f</sup> Vrije Universiteit Amsterdam, Athena institute for Transdisciplinary Research, Amsterdam, the Netherlands

<sup>g</sup> Amsterdam UMC, the Netherlands

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## ABSTRACT

**Objective:** This cross-sectional questionnaire study investigates if there a difference in the extent to which health care providers in prenatal Shared Medical Appointments (CenteringPregnancy©) and in prenatal individual appointments support self-management in patient education. It also investigates if there is a difference in the extent to which health care providers in CenteringPregnancy@ and in individual appointments pay attention to the factors of the Integrated Model for Behavioral Change (I-Change) in supporting self-management.

**Methods:** Dutch health care providers in prenatal care were invited to fill out a questionnaire. Respondents who provided care in CenteringPregnancy© formed the CenteringPregnancy© group, the others were categorized in the individual appointments' group. After a definition of self-management and an introduction of the I-Change model, respondents were asked if they supported self-management and if they paid attention to the I-Change model for each of 17 themes of prenatal patient education. Pearson's chi-squared tests and Fisher's Exact tests were performed to compare both groups.

**Results:** We included 133 respondents. Health care providers in the CenteringPregnancy@ group supported self-management to a higher extent compared to the individual appointments group. This difference was statistically significant for eight themes (*body position and exercises, oral health, domestic violence, birth mechanism and pre-mature birth, postnatal period, transition from pregnancy to parenthood, taking care of the baby and newborn's safety*). In both groups, health care providers paid most attention to information or to awareness factors instead of motivation factors.

**Conclusion:** We found a first prove that health care providers in CenteringPregnancy@ support self-management to a higher extent than health care providers in individual appointments. This could be explained by factors as time, feelings of safety and bonding, continuity of care and emphasis on future health behaviour changes. For effective self-management support, attention to motivation factors is important. However, we found that health care providers in both groups paid more attention to information or to awareness factors than to motivation.

**Practice implications:** Health care providers in prenatal individual appointments should be aware of the fact that they possibly support self-management less than health care providers in CenteringPregnancy@. Health care providers in both types of prenatal care should be aware of the fact that they pay little attention to motivation factors. They might need some skills to change their role from teaching professional to supportive leader.

\* Correspondence to: AVAG, Dirk Huizingastraal 3-5, 9713 GL Groningen, the Netherlands.

E-mail address: [annatsiamp@hotmail.com](mailto:annatsiamp@hotmail.com) (A.H.C. Tsiamparlis-Wildeboer).

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## 1. Introduction

Patient education is sensitive to changes in health concepts. Due to social developments as the aging of the population and the increase of patients with chronic diseases [1–3], health concepts based on health as “a state of complete physical, mental and social well-being” [4] changed into broader concepts in which health perception is based on patients’ ability for self-management [5]. The term self-management implies “the individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition.” [2]. For this ability, individuals need support in acquiring self-management skills that make them capable to solve problems, to form good relationships with health care providers [6] and to set goals [7]. Although pregnancy is not a chronic condition, the acquisition of self-management skills is also very important for pregnant women, as it enables them to set goals and to make health behaviour changes for the benefit of themselves and their (unborn) child.

Health care providers can support self-management in various settings, e.g. in individual appointments or in group education. Studies about self-management education for type 2 diabetic patients showed that group-based education interventions were more effective than individual education at improving clinical outcomes [8,9], self-management skills [8,10,11], knowledge [8,9,11] and empowerment/self-efficacy [8]. A valuable method for group-based self-management education are Shared Medical Appointments (SMA), where health care providers encourage participants to become responsible for their own health and to make changes in health behaviour by improving their self-management skills [12]. To succeed in this encouragement, health care providers need insight in the nature of health behaviour and in the factors that act upon this [13]. The factors that influence health behaviour are represented in the I-Change model [14] (Fig. 1). This Integrated Model for Behavioral Change explains motivational and behavioral changes by combining the Theory of Reasoned Action [15], the Social Cognitive Theory [16], the Trans-theoretical Model [17], and the Precaution Adoption Model [18]. According to the I-Change model, health behaviour changes are the result of motivation, intentions and abilities, but can be hindered by barriers. By taking into account these factors, patient education focuses on motivation, intention and the development of self-management skills [3, 19].

In Dutch prenatal care, the SMA exist since the introduction in 2012 of the CenteringPregnancy© program [20]. In this program, which

originates from the United States, 8–12 pregnant women with approximately the same gestational age, gather for prenatal care and education. The SMA follows the normal schedule for individual appointments in prenatal care, but sessions last 120 min instead of 10–15 min and are led by at least two health care providers. These providers give one-on-one time to the participants by doing medical examinations, but they also provide group-based patient education [21]. The content of this education is based on a lesson book, dividing prenatal and postnatal topics in 17 themes (e.g. nutrition, breastfeeding), related to positive pregnancy outcomes, good parenthood and healthy life style [21,22]. Aim of the education is to empower participants and to encourage them by developing their self-management skills to make healthy choices, not only for their pregnancy, but also for the rest of their life [21,23,24].

Several studies showed effectiveness of CenteringPregnancy© in decreasing the numbers of children that were born preterm or with low-birthweight [25,26] and in the promotion of breastfeeding [26,27]. Other studies highlighted that providing information and support in CenteringPregnancy© is effective in health behaviour changes [21,28] and that developing self-management skills leads to active involvement in maternity care [24]. However, no study has compared the support of self-management in CenteringPregnancy© and in individual appointments, while this could have added value for patient education. For this reason, the aim of our study is to compare to which extent health care providers support self-management in CenteringPregnancy© and in individual appointments, and to which extent they pay attention to the factors of the I-Change model in supporting self-management. Our research questions are the following:

1. Is there a difference in the extent to which health care providers in prenatal Shared Medical Appointments (CenteringPregnancy©) and in prenatal individual appointments support self-management in 17 themes of patient education?
2. Is there a difference in the extent to which health care providers in prenatal Shared Medical Appointments (CenteringPregnancy©) and in prenatal individual appointments pay attention to the factors of the I-Change model in supporting self-management?

## 2. Methods

### 2.1. Participants

This cross-sectional questionnaire study was carried out in the Netherlands between February and August 2021. Health care providers in prenatal care (midwives and gynecologists) were invited by e-mail,

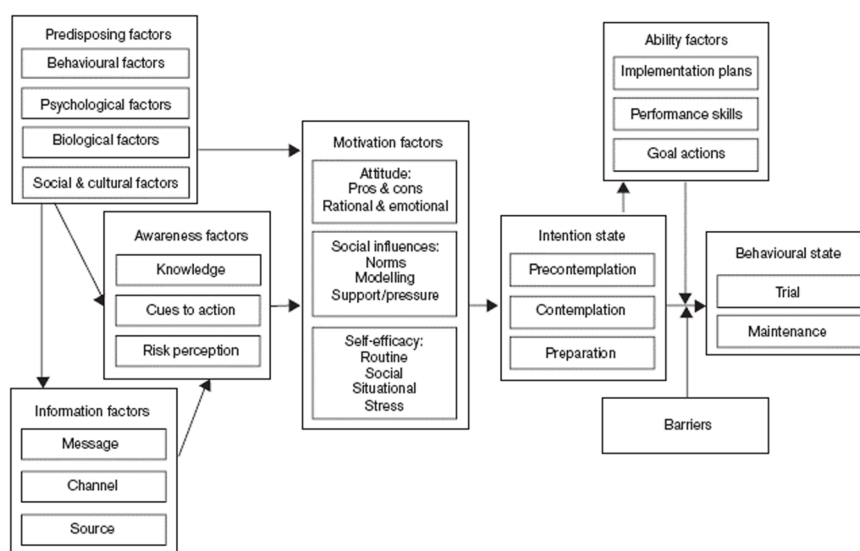


Fig. 1. I-Change model [14].

social media and personal requests to fill out a questionnaire about the support of self-management in either CenteringPregnancy® or in individual appointments. In the invitation, aim and design of the study were described and the questionnaire was appended in a separate weblink. The invitation also contained the contact details of the researchers. According to the Vrije Universiteit Amsterdam, the study complied to the Code of Ethics for Research.

## 2.2. Questionnaire development and data collection

The questions in the questionnaire (appendix 1) were based on literature about self-management, the themes for patient education in CenteringPregnancy® and discussions within the research team about the best possible ways to get answered the research questions in order to strengthen content validity. The questionnaire started with a statement for the respondents in which they declared (without filling in personal data) that they voluntarily filled out the questionnaire and that they gave permission for anonymous use of their answers for scientific purposes. Only if respondents agreed to this statement, they could proceed to the next 11 questions. After the baseline characteristics (Table 1), respondents were asked if they provided care to pregnant women in individual appointments or in CenteringPregnancy® between 2016 and 2021. Based on their answers, all respondents who did not provide care in CenteringPregnancy® were categorized in the individual appointments' group, all others formed the CenteringPregnancy® group. As a result, the questions about the support of self-management could be answered only for the right group.

In order to obtain higher validity, respondents first got a definition of self-management before they were asked if they supported self-management (yes/no) regarding each of the themes of patient education in CenteringPregnancy®. After this question, an illustration and explanation of the I-Change model followed. Information factors, awareness factors, motivation factors, ability factors and barriers were explained by text and by the components of the illustration and health care providers were asked to which factors they paid the most attention and to which factors they paid the least attention in supporting self-management regarding each of the themes. The questionnaire ended with a request for comments.

Before the dissemination of the final questionnaire, a pilot questionnaire was filled out and commented on by 41 health care providers in prenatal care. Based on the responses of this pilot questionnaire, answering options for the themes in which self-management was

supported were transformed from continuous (time in minutes) into dichotomous (yes/no) and the possibility to complete the questionnaire for both CenteringPregnancy® and individual appointments was technically excluded in order to avoid bias. After this, five experts independently confirmed the face validity of the questionnaire and nine raters were asked to fill out the survey twice with an interval of at least 24 h in order to determine intra-rater reliability. The results of the intra-rater variability were analyzed by means of Cohen's Kappa (appendix 2). The mean Kappa was 0.620 which means that overall intra-rater agreement was substantial.

## 2.3. Analyses

For the analysis of the data, IBM® SPSS® Statistics 27.0 was used. Respondents that did not complete the questions about the baseline characteristics or the questions about the support of self-management were excluded (Fig. 2). Baseline characteristics were analyzed in frequencies and means for both groups separately. The answers on the question about the promotion of self-management in the 17 themes were first analyzed in frequencies for each group and each theme separately. After this descriptive analysis, for each theme a Pearson's chi-squared test or Fisher's Exact test was performed, comparing the group that provided CenteringPregnancy® to the group that provided care in individual appointments (Table 2). Because of the risk of family-wise error, the  $\alpha$  was defined as  $< 0.03$ . The answers on the two questions about the factors of the I-Change model that got the most and least attention in the support of self-management were first analyzed for both groups separately in frequencies per factor (Table 3). After this analysis both groups were compared per factor by means of a Pearson's chi squared test.

## 3. Results

From the 189 respondents that filled out the questionnaire, 37 respondents were excluded because they did not complete the questions about the baseline characteristics or the questions about the support of self-management. From the remaining 152 respondents that met the criteria for inclusion, 19 were students. Because students only provide care under supervision, we decided to exclude them from the analysis too (Fig. 2).

From the remaining 133 respondents, 38 % provided care in CenteringPregnancy® and 62 % in individual appointments (Table 1).

Health care providers that provided CenteringPregnancy® supported self-management to a higher extent in each of the 17 themes compared to the individual appointments group. This difference was statistically significant for eight themes (see Table 2).

The questions about the factors of the I-Change model (Table 3) to which health care providers paid the most attention in supporting self-management were completed by 84 % of the respondents in the group that provided CenteringPregnancy® and by 73 % of the respondents in the group of the individual appointments. The questions about the factors of the I-Change model to which health care providers paid the least attention were filled out by less respondents, namely by 67 % in the CenteringPregnancy® group and by 56 % in the individual appointments group.

In the individual appointments group, health care providers paid the most attention to information factors (mean 37 %) and awareness factors (mean 29 %) in supporting self-management. This differs from the CenteringPregnancy® group where health care providers in the first place paid the most attention to awareness factors (mean 42 %), and then to information factors (mean 37 %). Regarding the factors to which health care providers paid the least attention, both groups gave the same responses. In supporting self-management, health care providers paid the least attention to barriers that hinder pregnant women to develop self-management skills (mean 44 % in the individual appointments group and 35 % in CenteringPregnancy®) and to factors that enable

**Table 1**

Baseline characteristics of the health care providers providing care to pregnant women in individual appointments and in CenteringPregnancy® (N = 133).

Baseline characteristics	Individual appointments (n = 82, 62 %)	CenteringPregnancy® (n = 51, 38 %)
Age in years*	40 (11.7)	42 (11.3)
Years past from graduation*	15 (10.7)	17 (9.8)
Working domain	66 80 %	43 84 %
Primary care	14 17 %	4 8 %
Secondary care	2 3 %	4 8 %
Otherwise		
Participation in a training for CenteringPregnancy®	17	50
Yes	65	1
No		
Participation in a course about Positive Health	2161	1832
Yes		
No		
Participation in a course about self-management	1765	1140
Yes		
No		

\* Mean (SD)

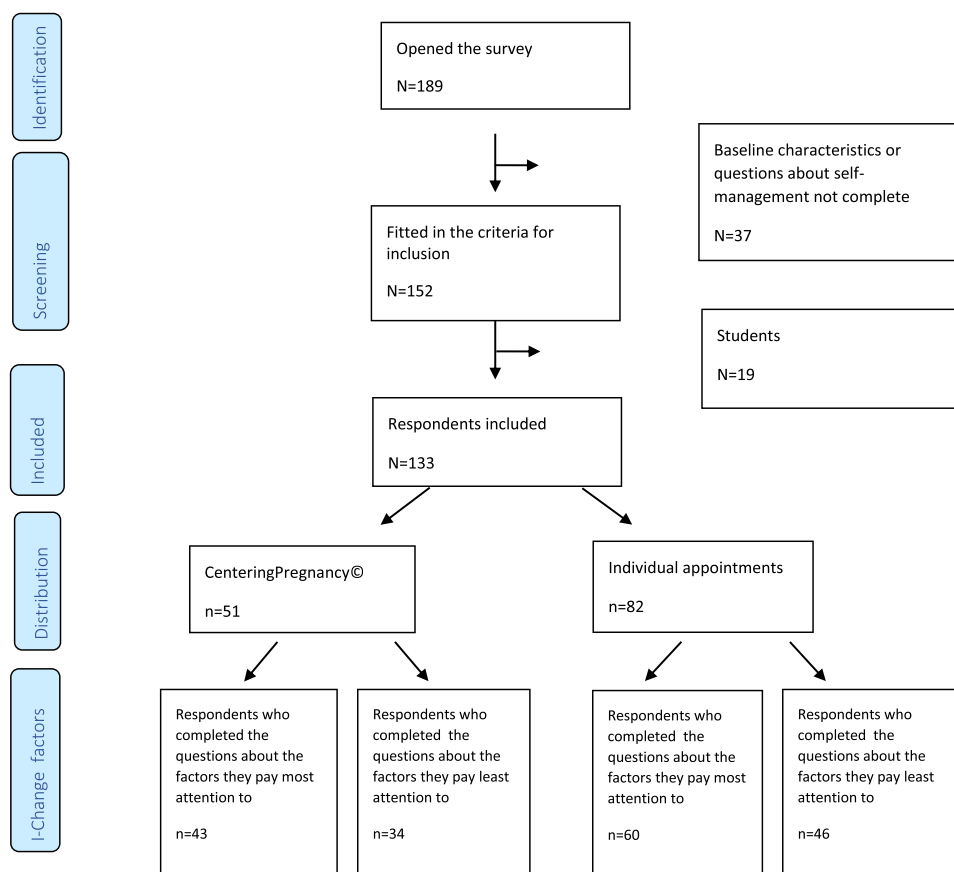


Fig. 2. Flowchart of the inclusions/exclusions.

pregnant women to develop self-management skills (= ability factors, means respectively 25 % and 19 %). None of these differences were statistically significant.

## 4. Discussion and conclusion

### 4.1. Discussion

#### 4.1.1. Summary of findings

Health care providers in CenteringPregnancy© support self-management in prenatal care to a higher extent than health care providers in individual appointments. In eight of the 17 themes, this difference is statistically significant. Half of these statistically significant themes concern prenatal topics (*body position and exercises, oral health, domestic violence, birth mechanism and premature birth*), the other four concern postnatal topics (*postnatal period, transition from pregnancy to parenthood, taking care of the baby and newborn's safety*). In supporting self-management, health care providers in both groups pay attention to the factors of the I-Change model, but in individual appointments they seem to pay most attention to information factors before awareness factors, while in CenteringPregnancy© they seem to pay most attention to awareness factors before information factors.

#### 4.1.2. Explanation of findings

A partial explanation of the higher extent of self-management support in CenteringPregnancy© could be the fact that 98 % of the health care providers in CenteringPregnancy© participated in a training for CenteringPregnancy© and got the lesson book of this training against 21 % of the health care providers in individual appointments. Both training and lesson book are based on the philosophy of CenteringPregnancy© to encourage pregnant women to make health behaviour changes for their

pregnancy and for the rest of their life [21,23] by developing their self-management skills. At the other hand, all students of the Dutch (para)medical schools are taught techniques for self-management support, such as Motivational Interviewing and Shared Decision Making, so all Dutch health care providers have got the tools for self-management support. The emphasis on future health behaviour changes in the philosophy of CenteringPregnancy© could explain the fact that half of the themes in which the higher extent of self-management support in CenteringPregnancy© is statistically significant is postnatal. By promoting postnatal self-management in the prenatal period, health care providers in CenteringPregnancy© comply to the condition of the WHO that “Antenatal care should provide support and guidance to the pregnant woman and her partner or family, to help them in their transition to parenthood” [29] and to the recommendation of the ACOG to start guidance of postpartum care in the prenatal period [30].

A second explanation for the higher extent of self-management support in CenteringPregnancy© could be the extra time for patient education within the SMA, which makes it easier for health care providers to focus on self-management rather than on the exclusive transfer of knowledge. This extra time could also be the reason that the higher extent of self-management support for “big” themes as *domestic violence* and *body position and exercises* is statistically significant. The beneficial effect of the factor “time” on learning opportunities in the SMA has also been found in other studies [12,21,24,31,32].

The fact that group dynamics plays an important role in CenteringPregnancy© could be a third explanation for the higher extent of self-management support. According to Tsiamparlis et al. [12], feelings of bonding and safety might create an atmosphere of openness and social support, promoting learning opportunities through modelling and self-management. This atmosphere of openness might also be favorable to a “difficult” theme as *domestic violence*.

**Table 2**

The difference in the extent to which health care providers (N = 133) support self-management in individual appointments and in CenteringPregnancy© for each of the 17 themes.

Themes	Individual appointments (n = 82)		CenteringPregnancy© (n = 51)		P value
	Support	No support	Support	No support	
Nutrition and healthy lifestyle	76 (93 %)	6 (7 %)	51 (100 %)	0 (0 %)	0.082 <sup>b</sup>
Physical changes and discomforts	76 (93 %)	6 (7 %)	51 (100 %)	0 (0 %)	0.082 <sup>b</sup>
Body position and exercises	63 (78 %)	18 (22 %)*	48 (94 %)	3 (6 %)	<b>0.012<sup>a,c</sup></b>
Oral health	35 (43 %)	47 (57 %)	38 (76 %)	12 (24 %)*	<b>&lt; 0.01<sup>a</sup></b>
Mental well-being in pregnancy	69 (85 %)	12 (15 %)*	51 (100 %)	0 (0 %)	0.003 <sup>b</sup>
Fetal movements	77 (95 %)	4 (5 %)*	49 (96 %)	2 (4 %)	1.000 <sup>b</sup>
Breastfeeding	72 (89 %)	9 (11 %)*	48 (96 %)	2 (4 %)*	0.204 <sup>b</sup>
Domestic violence	34 (41 %)	48 (59 %)	48 (94 %)	3 (6 %)	<b>&lt; 0.01<sup>a,c</sup></b>
Family planning, sexuality and contraception	76 (94 %)	5 (6 %)*	48 (94 %)	3 (6 %)	1.000 <sup>b</sup>
Preparation for birth, when to call	75 (91 %)	7 (9 %)	49 (96 %)	2 (4 %)	0.481 <sup>b</sup>
Birth mechanism and premature birth	52 (63 %)	30 (37 %)	47 (92 %)	4 (8 %)	<b>&lt; 0.01<sup>a,c</sup></b>
Childbirth experience and pain management	77 (94 %)	5 (6 %)	50 (98 %)	1 (2 %)	0.406 <sup>b</sup>
Postnatal period	63 (77 %)	19 (23 %)	51 (100 %)	0 (0 %)	<b>&lt; 0.01<sup>b,c</sup></b>
Transition from pregnancy to parenthood	44 (54 %)	38 (46 %)	47 (92 %)	4 (8 %)	<b>&lt; 0.01<sup>a,c</sup></b>
Postpartum mood disorders	63 (77 %)	19 (23 %)	49 (96 %)	2 (4 %)	0.003 <sup>a</sup>
Taking care of the baby	52 (63 %)	30 (37 %)	49 (96 %)	2 (4 %)	<b>&lt; 0.01<sup>a,c</sup></b>
Newborn's safety	47 (59 %)	33 (41 %)*	45 (88 %)	6 (12 %)	<b>&lt; 0.01<sup>a,c</sup></b>

<sup>a</sup>Pearson's chi-squared test

<sup>b</sup>Fisher's Exact Test

<sup>c</sup>statistically significant ( $\alpha < 0.03$ )

\* 1 missing \*\* 2 missings

A fourth explanation for the higher extent of self-management support in CenteringPregnancy© could be the fact that health care providers in this program are the same in all sessions, while in Dutch prenatal care health pregnant women rarely meet the same health care provider in every individual appointment. Continuity of care promotes personalized

care, making it easier for health care providers to support pregnant women in setting goals, making decisions and supporting other self-management skills. The positive impact of continuity of care on patient education in the SMA has also been mentioned in other studies [12, 21,24,32,33,34,35].

According to the I-Change model, awareness factors are a result of information and of predisposing factors and they form the first step towards behavioral changes [14]. The fact that awareness factors play an important role in patient education in CenteringPregnancy© corresponds with the earlier mentioned effectiveness of CenteringPregnancy© in health behaviour changes [21,28] and in the developing of self-management skills [24]. However, the question arises why the majority (79 %) of the health care providers in CenteringPregnancy© seem to pay most attention to awareness factors or to information factors and why they do not move forward to the next step, the motivation factors. As mentioned previously, the aim of CenteringPregnancy© is to empower pregnant women and to encourage them to become responsible for their own health [21,23]. Becoming responsible also implies being prepared to make changes in health behaviour and motivation is the energy that directs these changes (3,21,36). A possible answer on this question could be associated with the fact that health care providers are educated to transfer knowledge and that they miss skills [12] to change their role from teaching professional to collaborator, health advocate and supportive leader [37] by motivating women to achieve their goals. Another explanation could possibly be found in the level of knowledge or awareness of the participants of the group. If this level is low, creating awareness is the first step towards motivation. All our hypotheses, however, need further research.

#### 4.1.3. Strengths and limitations

A strength of our study is that it is the first study that compares the differences in the extent of self-management support in CenteringPregnancy© and in individual appointments and in the extent to which both groups pay attention to the factors of the I-Change model. We are aware of the fact that statistically our study knows limitations, but overall our data give a first, good impression of the differences in the support of self-management between both groups. A first limitation of our study is the fact that we did not use a validated questionnaire. We tried to strengthen the validity of the questionnaire by introducing the questions with clear definitions of self-management and of the I-Change model. Another limitation of our study is the small number of respondents, especially in relation to the family-wise tests we performed. A third possible limitation is the difference between the groups in relation to the participation in a CenteringPregnancy© training, which might have impact on the results, although health care providers from both groups are educated in self-management support. This impact of the CenteringPregnancy© training and lesson book must be examined in further research. We do not know why health care providers completed the questions about the I-Change model less often than the questions about the self-management support. We only can guess that this might

**Table 3**

The difference in the extent to which health care providers paid the most and least attention to the factors of the I-Change model in supporting self-management in individual appointments and in CenteringPregnancy©.

Factors	Individual appointments Most attention n = 60		P value	Centering-Pregnancy© Most attention n = 43		P value	Individual appointments Least attention n = 46		P value	Centering-Pregnancy©Least attention n = 34		P value
Information factors	37 %		0.546	37 %			3 %		0.594	3 %		
Motivation factors	7 %		0.060	7 %			7 %		0.060	13 %		
Awareness factors	29 %		0.328	42 %			3 %		0.343	1 %		
Ability factors	8 %		0.302	12 %			25 %		0.342	19 %		
Barriers	2 %		0.997	2 %			44 %		0.891	35 %		
None	17 %			0 %			18 %			29 %		



be caused by the length of the questionnaire, by an unfamiliarity with the I-Change model or by a difficulty to determine the factors they paid attention to or not. An amended questionnaire that only can be submitted if fully completed and an increase of the number of participants are necessary for further research in order to draw statistically stronger and more generalizable conclusions.

#### 4.2. Conclusion

We found a first prove that health care providers in CenteringPregnancy® support self-management to a higher extent than health care providers in individual appointments. Explanations for this difference might be factors as time, feelings of safety and bonding, continuity of care and emphasis on future health behaviour changes, but further investigation is needed for statistically stronger and more generalizable conclusions. For effective self-management support aiming at health behaviour changes, attention to motivation factors is important. However, we found that health care providers in both groups paid most attention to awareness and to information factors instead of motivation factors. Further qualitative research concerning the reasons for this discrepancy should be undertaken.

#### 4.3. Practice implications

Health care providers in prenatal individual appointments should be aware of the fact that they possibly support self-management less than health care providers in CenteringPregnancy®. They could partly bridge this gap by considering practical solutions as spending more time on patient education, offering continuity of care, participation in a training for CenteringPregnancy® or making a shift towards the SMA. Health care providers in both types of prenatal care should be aware of the fact that they pay less attention to motivation factors. They might need some skills to change their role from teaching professional to supportive leader. These skills should be offered in the curricula of the (para) medical schools of in continuing training.

#### CRedit authorship contribution statement

**Tsiampalis-Wildeboer:** Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration. **Feijen-De Jong:** Conceptualization, Methodology, Investigation, Writing – review & editing, Supervision. **Van Lohuizen:** Methodology, Formal analysis, Writing – review & editing. **Tichelman:** Methodology, Software, Formal analysis, Writing – review & editing. **De Jonge:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Scheele:** Conceptualization, Methodology, Writing – review & editing, Supervision.

#### Declarations of Competing Interest

None.

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#### Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.pec.2022.107579](https://doi.org/10.1016/j.pec.2022.107579).

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