

Reproductive health peer education for multicultural target groups

Peters IA

Schölmerich VLN

van Veen DW,

Stegers EAP

Denktas, S

Journal for Multicultural Education 2014;8(3):162-78.

ABSTRACT

Purpose: Dutch perinatal mortality rates are relatively high compared to other European countries. Non-Western ethnic minorities show particularly adverse outcomes. They seem to have low health literacy and less access to health care. We studied the characteristics of the participants and the success of the recruitment methods and increase in knowledge of participants in Reproductive Health Peer Education (RHPE). *Design:* we targeted specifically these groups, and developed reproductive health education covering the full spectrum of obstetric care, led by specifically trained female peer educators coming from the targeted communities.

Findings: 'Active' recruitment methods were the most successful methods. 1896 women and 275 men were recruited and participated in the intervention. 65% of the total female participants had a first generation immigrant background. Significant knowledge improvements were found on all five measurements of reproductive behaviour and antenatal and postnatal health care system knowledge (24% average knowledge increase in already knowledgeable participant group and 46% in the not knowledgeable group).

Conclusion: active interpersonal recruitment methods were most successful in reaching the target groups. Peer education resulted in knowledge increase in these groups. Practice implications: invest in training of educators for peer education reproductive health. Organize recruitment by verbal advertising by community organizations and social networks of peer educators.

Originality: to our knowledge, no studies have been conducted combining investigation of the results of specific recruitment methods, the characteristics of reached participants in a multi-ethnic population and their increase in knowledge about reproductive health and care.

INTRODUCTION

Perinatal mortality rates are relatively high in the Netherlands when compared to all other European countries.¹ This is in particular the case for large cities where perinatal mortality rates are 20 to 50% higher than in rural areas.^{2, 3} Within large cities, substantial inequalities can be found. For instance, in Rotterdam, neighborhood perinatal mortality rates range from 2 to 34%.³ Inequalities can also be found when considering the perinatal health of different ethnic groups. Among non-western ethnic minority women, the perinatal mortality rates are higher than those of western minorities and the native Dutch.³ Non-western ethnic minorities represent 11,4% of the population of the Netherlands and 32% of the inhabitants of the four largest cities in the Netherlands.⁴ Many studies have shown that ethnicity and socio-economic deprivation are strongly related to adverse perinatal outcomes such as preterm birth and too small for gestational age.⁵⁻⁷ These trends are not unique to perinatal outcomes, but can also be seen when considering the general health of non-western ethnic minorities in a socio-economic disadvantaged position.⁸

When compared to Dutch natives and western minorities, non-western ethnic minorities groups not only show poorer general health, but are also underserved by health care (RIVM, 2007). This means that they have insufficient access to health care, as evidenced by not timely use of health services which can affect their health outcomes.⁹ Ample studies have indicated a relationship between access to health care and general health.^{10, 11} Some studies even claim that limited access to health care resources is the most important contributing factor for ethnic disparities in health.^{12, 13} In the area of reproductive health, one third of Moroccan and Antillean women book their first antenatal visit with an obstetric caregiver after 14 weeks of pregnancy, which is often too late to allow for routine first trimester prenatal screening and provision of other prenatal healthcare.^{13, 14} Health literacy is also problematic as these groups have e.g. low awareness of folic acid supplementation and of the negative effect of smoking during pregnancy.^{15, 16} Limited knowledge of health services in general and reproductive health services specifically can be a major barrier to use health care services.^{10, 17}

In 2009 an urban perinatal health programme called 'Ready for a Baby' was initiated in Rotterdam, the second largest city of the Netherlands.¹⁸ Rotterdam has a population of more than 600.000 citizens. 52% of the inhabitants have a native Dutch background, 11% have a western minority background and 37% have a non-western minority background.^{19, 20} The largest minority groups are from Suriname (9%), Turkey (8%), Morocco (7%), the Dutch Antilles (4%) and Cape Verde (3%).²⁰

The aim of the city wide Ready for a Baby programme is to tackle perinatal health inequalities and to improve perinatal health outcomes. Timely reaching of women with a high risk profile is an important aim of this programme. Therefore, we developed -

as a part of this program - an intervention aimed at improving the low reproductive health (care) literacy of non-western ethnic minority groups in socially disadvantaged neighbourhoods.

We hypothesized that 1) active recruitment methods based on interpersonal interaction are more effective methods in reaching the target groups for reproductive health education than passive methods, and 2) for the target groups customized peer education is an effective method to increase knowledge about reproductive health and the healthcare system.

METHODS

Reproductive health peer education: theoretical framework

Health related peer education is an approach whereby community members are supported to promote health-enhancing change among their peers. A more conventional method would be to train (non-peer) health professionals to address the needs of specific target groups. Proponents of peer education argue that specifically trained lay people are in a better position to encourage healthy behavior amongst their peers. Turner and Shepherd listed 10 commonly cited and review based arguments for the use of peer education (see box 8.1).²²

Box 8.1

- | | |
|----|---|
| 1 | Peer education can be used to educate those who are hard to reach through conventional methods |
| 2 | It utilises an already established means of sharing information and advice |
| 3 | Education presented by peers may be acceptable when other education is not |
| 4 | Peer education is beneficial for those involved |
| 5 | Peer educators act as good role models |
| 6 | It is more cost effective then other methods |
| 7 | Peers are more successful than professionals in passing on information because people identify with their peers |
| 8 | Peer education is empowering for those involved |
| 9 | Peers are a credible source of information |
| 10 | Peers can reinforce learning through ongoing contact |

Phase I: training peer educators

The first phase of the intervention started in September 2010. 16 bilingual women with a non-western ethnic minority background, and a high school diploma were trained during a full-time six month course (intermediate vocational educational level 4) to become peer educators. The course covered a wide range of topics, including communication and health education skills, basic knowledge about diseases and the Dutch health care system. The focus of the course was on reproductive health. The students were trained to lead four educational meetings: preconception, antenatal, intrapartum and postpartum health and care (see box 8.2). During the course, the students were also trained to translate the (biomedical) messages of caregivers into the language and cultural framework of an ethnically diverse target group. In 2011, 12 students graduated as peer educators perinatal health. The educators had different backgrounds: Moroccan (Dutch/Arabic/Berber language proficiency (LP), Turkish (Dutch/Turkish LP), Antillean (Dutch/Papiamento/Spanish LP), Surinamese-Creole (Dutch/Scranantango LP), Brazilian (Dutch/Portuguese LP), and Cape Verdean (Dutch/Portuguese LP).

Box 8.2 Peer education modules & topics

1	Preconception health and care Folic acid, alcohol, drugs, cigarette use, healthy nutrition intake, sexual transmitted diseases, medication, lifestyle of male partner, preconception health care system.
2	Antenatal health and care Healthy lifestyle, the three trimesters of pregnancy, pregnancy symptoms, necessity of pregnancy checks and preparation for childbirth, organization of antenatal care,
3	Intrapartum health and care Starting of the delivery, contractions, rupture of membranes, childbearing process, placenta, complications, painkillers.
4	Post partum health and care The delivery, risk signals, a healthy start for mother and child, motherhood, infant and youth centres, post partum health care system

Phase II: recruiting participants and execution of the peer educational Meetings

Phase II started in July 2011 and ended in April 2012. Primarily women were targeted, but men who were interested to participate were not excluded. Inspired by previous studies²², the participants were recruited by two active and two passive methods (see figure 8.1).

Peer educational meetings

After recruitment of the participants the meetings were organized. The meetings always had the same structure:

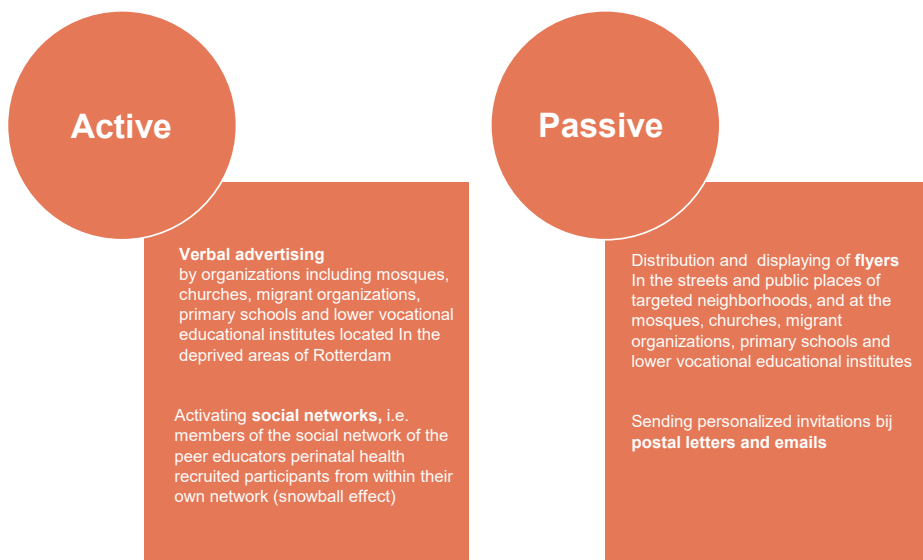


Figure 8.1 Active and passive recruitment methods

- *Start*: acquaintance and fill in pre-test questionnaires by participants;
- *Peer Education*: customized knowledge transfer using presentations, role-play, discussions, images (e.g. in case of very low educated groups), educational video clips and games (e.g. in case of an adolescent group).
- *End*: verbal evaluation and fill in post-test questionnaires by participants.
In order to create a safe and open atmosphere women's and men's groups were separated.

Measurements

To collect data on the characteristics of the individuals reached by this pilot, participants were asked to fill in questionnaires. Twenty-five percent of the 2171 individuals who filled in the questionnaire received assistance from the peer educators because of their low language proficiency level. The questionnaires were specifically adjusted for the four aforementioned peer education meetings (see box 8.2).

The questionnaires obtained information about the participants' socio-demographic characteristics: age [year of birth], ethnic background [participant's country of birth and that of his or her parents], generation [first generation immigrants are born outside the Netherlands, second generation immigrants are born in the Netherlands and have at least one parent born abroad]²³, marital status [yes/no], children [yes/no], educational attainment level [from low: not completed education, primary school to high: higher vocational education, university, other: residual category], place of residence [four digit zip code]. Information about residence made it possible to infer their neighborhood

social-economic classification by using the ‘Social Index’. This index is calculated annually for the Rotterdam municipal authorities by the Centre for Research and Statistics Rotterdam. The Social Index is a composite multidimensional variable indicating neighborhood social quality on a 1-10 scale.^{24, 25} Self-reported information about the Dutch language proficiency of the participants was also obtained [“When you have a conversation in the Dutch language do you have difficulty with it?” [low: often/always difficulty, intermediate: frequently but not always difficulty, high: never difficulties].

Information was also obtained about the way participants were recruited by the open-ended question “How were you recruited for this meeting?” Answers were categorized into ‘verbal advertising by organizations’, ‘flyers’, ‘mailing’ and ‘social network’. Furthermore, participant’s preferences for healthcare providers or other caregivers when seeking advice about preconception, antenatal, intrapartum and postpartum health and care were asked. Finally, information was obtained about knowledge of reproductive health and the health care system before and after the meeting. For example, before the meetings on preconception we asked whether the participant knew what preconception care is and after the meetings we asked whether she/he had learned new information about preconception care.

Analysis

First we described the participants by socio-demographic and socio-economic status, according to ethnic background. Chi-Square testing was performed to detect significant differences. To evaluate whether reproductive health (care) knowledge had increased, the non-parametric statistical McNemar test was used. All analyses were performed using IBM SPSS Statistics 20.

RESULTS

Response

In less than ten months, 1896 women and 275 men were recruited and participated in the intervention (table 8.1). Eighty four participants were excluded from the analyses because of missing or incomplete questionnaires, e.g. missing gender variable. 88% of the male participants were adolescents (<19 years). 90% of the female and 66% of the male participants had an ethnic minority background. 71% of the female participants lived in a neighbourhood classified as ‘problematic’ or ‘vulnerable’ by the Social Index. Relatively more men (65%) lived in a neighbourhood classified as social ‘sufficient’. Only 17% of the female participants had ‘insufficient’ language proficiency.

Table 8.1 Background characteristics of participants in Reproductive Health Peer Education
N=217

Variable	Women		Men	
	N	%	N	%
Total	1896	87	275	13
Age (years)	1658		267	
,19<<19	449	27	236	88
20-29	252	15	10	4
30-39	412	25	7	3
40-59	412	25	11	4
≥60	133	8	3	1
Ethnic origin	1807		263	
Native Dutch	181	10	90	34
Surinamese	180	10	41	16
Antillean	74	4	30	11
Cape Verdean	55	3	5	2
Turkish	452	25	36	14
Moroccan	669	37	31	12
Other	192	11	30	11
Generation	1803		264	
First generation immigrant	1172	65	50	19
Second generation immigrant	444	25	124	47
Native Dutch	187	10	90	34
Married	1767		220	
Yes	1096	62	20	9
Children	1719		224	
Yes	1230	72	29	13
Educational attainment level	1692		442	
Low	795	47	151	62
Intermediate	718	38	88	36
High	67	4	1	1
Other	112	7	2	1
Social Index Score	1906		166	
Problematic 3.9 - 4.9	204	13	10	6

Table 8.1 Background characteristics of participants in Reproductive Health Peer Education N=217 (continued)

Variable	Women		Men	
	N	%	N	%
Vulnerable 5.0 – 5.9	932	58	33	20
Sufficient 6.0 – 7.0	449	28	107	65
Strong ≥ 7.1	24	1	16	10
Language proficiency	1519		221	
Insufficient	250	17	21	10
Sufficient	593	39	28	12
Good	676	44	172	78

Preferences of participants for health care professionals

Figure 8.2 shows the preferences of female participants for health care professionals or other caregivers with respect to the various reproductive stages. The results indicate the predominant preference for the midwife and the general practitioner during the pre-conceptional and antenatal period. In the post partum period midwives and maternity nurses are reported as the preferred care providers followed by the family. Most men preferred the general practitioner during the preconception period, and the GP and the gynaecologist during the antenatal period. Because of the small size of the male participants results are not shown in the figure.

Results recruitment methods

Figure 8.3 shows the results of the four recruitment methods for each of the reproductive health meetings. The coloured lines with percentages show the contribution of a method for recruitment of participants for each of the four educational meetings. The peer educators organized 105 network meetings together with community organizations to achieve cooperation of these organizations in the recruitment. 75% of these network meetings directly resulted in inclusion of participants in the reproductive health meetings. 800 Flyers were distributed and 350 postal- and e-mails were sent which accounted for 2% of the participants in the meetings. The interpersonal methods 'verbal advertising by organizations' and 'social network' were the most successful. Almost all participating men (91%) had been reached by 'Verbal advertising by organizations' (not shown in figure).

In addition to figure 8.2, table 8.2a and b show ethnic and generational differences in recruitment. Native Dutch and ethnic minority women both were most effectively recruited by 'verbal advertising by organizations'. The 'social network' method was particularly successful in recruiting ethnic minority women. No major generational

differences were found in recruitment except that the flyer method was more successful in reaching the second than first generation participants.

Knowledge improvements of participants in RHPE

Finally, figure 8.4 shows significant improvements that were found on all five measurements of knowledge of adequate reproductive behaviour and the antenatal en postnatal

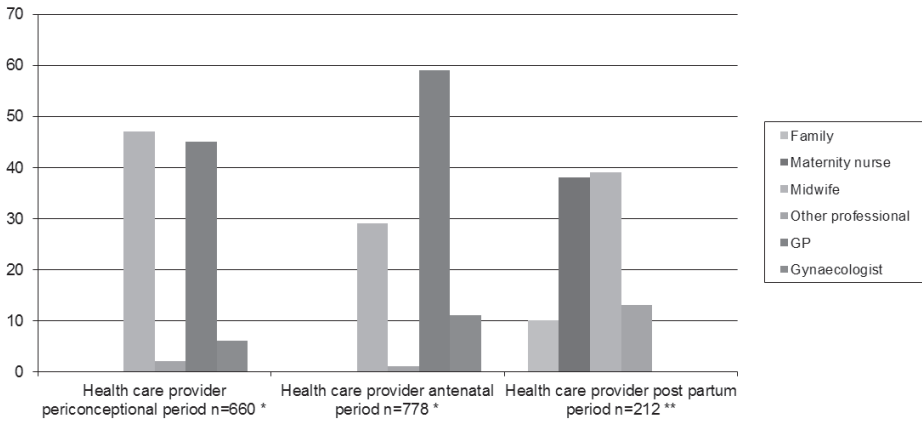


Figure 8.2 Preferences of female participants for perinatal healthcare professional

* Answer options: GP, Midwife, Gynaecologist and Other professional

** Answer options: GP, Midwife, Maternity nurse and Family

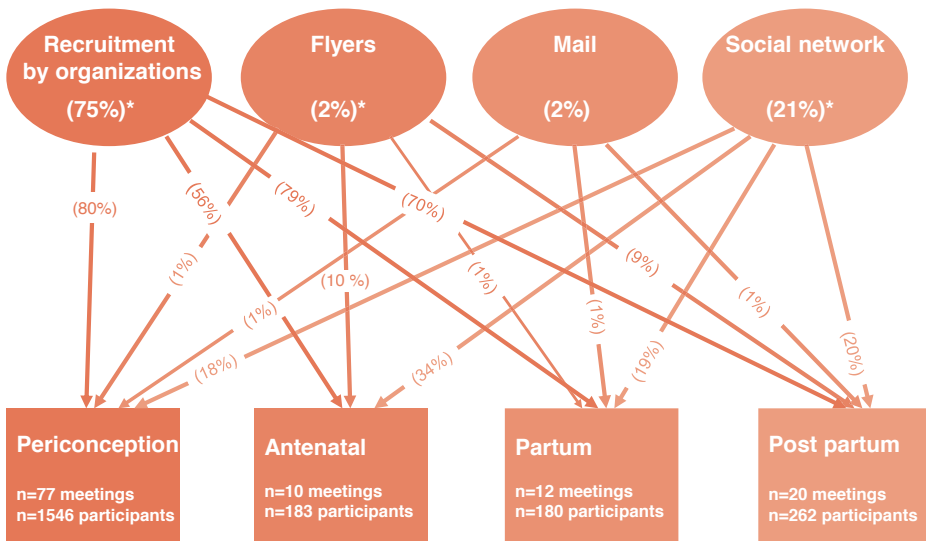


Figure 8.3 Recruitment of participants for Peer Education by four methods

*P-value <0.001

Table 8.2a. Recruitment results of female native Dutch and first and second generation minority group participants for Reproductive Health Peer Education n=1.388 (in absolute numbers and percentages)

	Dutch N=172	Surinamese N=122	Antillean N=57	Cape Verdean N=38	Turkish N=337	Moroccan N=510	Other ¹²³ N=152
Verbal advertising by organizations	153 (89) abcd	95 (77) ^a	47 (82) ^e	31 (82)	236 (70) ^b	363 (70) ^{ce}	107 (70) ^d
Flyers	2 (1)	1 (1)	0 (0)	4 (10)	9 (3)	18 (3)	6 (4)
Mailing	0 (0)	2 (2)	0 (0)	0 (0)	1 (0)	10 (2)	1 (1)
Social network	17 (10) ^{abcd}	24 (20) ^a	10 (18)	3 (8)	91 (27) ^b	119 (23) ^c	38 (25) ^d

Non-Western Asian and African immigrants

^a Significant (<0.05) difference between native Dutch and Surinamese group

^b Significant (<0.001) difference between native Dutch and Turkish group

^c Significant (<0.001) difference between native Dutch and Moroccan group

^d Significant (<0.001) difference between native Dutch and Other group¹

^e Significant (<0.05) difference between Antillean and Moroccan group

Table 8.2b. Recruitment results of female immigrant generations for Perinatal Health Peer Education n= 1.235 (in absolute numbers and percentages)

	First generation n=880	Second generation n=355
Verbal advertising by organizations	626 (71)	253 (71)
Flyers	17 (2)*	23 (6)*
Mailing	12 (1)	2 (1)
Social network	225 (26)	77 (22)

* Significant (<0.001) difference between first and second immigrant generation

health care system. For example, participants who did not know what folic acid and preconception care were before the reproductive health meeting had a significantly self-reported knowledge increase on this subjects of respectively 69% and 70%.

DISCUSSION AND CONCLUSION

Discussion

Non Western immigrant women are commonly difficult to reach, especially the first generation. In our study 65% of the total female participants had a first generation immigrant background. The recruitment results confirmed our first hypothesis that, active recruitment methods based on interpersonal interaction are more effective methods in reaching the target groups for reproductive health education than passive methods.

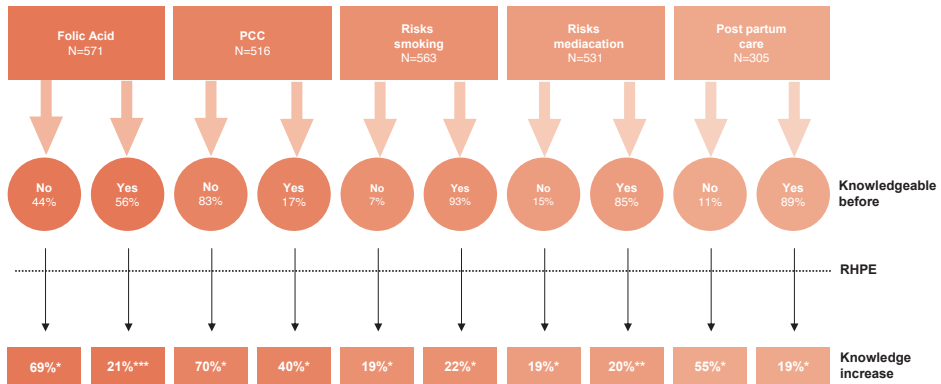


Figure 8.4 Knowledge before and after Reproductive Health Peer Education (RHPE)

* P-value <0.001 PCC: Preconception Care

** P-value <0.05 Risks smoking: health risks of smoking before and during pregnancy

*** P-value >0.05 Risks medication: health risks of medication use before and during pregnancy

Of all recruitment methods used, the active recruitment method ‘verbal advertising by organizations’ and ‘social network’ were most successful.

A comparison of demographic data of our participants with those from the general population confirmed that we reached our target group, i.e. participants with a non-western minority background living in socially deprived areas with potentially limited access to receive adequate antenatal and postnatal health care. A large majority (90%) of the participants were from a female immigrant background and lived in a neighbourhood receiving a ‘problematic’ or ‘vulnerable’ Social Index score. These neighbourhoods are at increased risk for adverse perinatal outcomes (perinatal mortality and perinatal morbidity).²⁵ According to data from the Centre of Research and Statistics Rotterdam (COS), these types of neighbourhoods show low scores for experienced health and high scores for registered use of primary care (but not for reproductive health care).^{14, 26} These low health scores are associated with low income, a low language proficiency level, unemployment, weak social network and social cohesion and poor housing.²⁶ These findings and our study results indicate that the target group needs support for healthy motherhood. The project successfully reached non-western ethnic minority females from deprived neighbourhoods. A majority of the participants lived in a neighbourhood (n=33) with a low Social Index score, 85% reported a low or intermediate educational level, and 17% of the females reported insufficient language proficiency. In these neighborhoods, a mean percentage of 2,4 [range 0,4 to 9,3%] among the target population [non Western female immigrants, aged between 18 and 42] was reached.²⁷ Compared to the native Dutch population more children are born in the non-Western immigrant groups.²⁷ The Dutch National Institute for Public Health and the Environment has indicated that preventive lifestyle

interventions are not able to reach low SES groups, let alone non-western immigrant groups.²⁸ Most Dutch publications about lifestyle interventions show a lack of absolute numbers of participation of specific target groups caused by the absence of registration of background characteristics like SES and ethnicity variables in these intervention programmes.²⁹

The change of knowledge results confirm our second hypothesis that for the target groups customized peer education is an effective method to increase knowledge about reproductive health (care). After participating in the educational meetings a knowledge increase regarding adequate folic acid use, preconception care, smoking and medication intake was observed.

Health peer education has become very popular in the broad field of HIV prevention and it is also used to reduce tobacco, drug or alcohol abuse among young people. While not commonly used within the field of reproductive health, several international examples can be found of prenatal and postnatal peer led educational programmes focused on preconception health, HIV prevention for pregnant woman, nutrition, mental health, breastfeeding and smoking.^{30, 31} Most of the pregnancy-related peer education programmes were developed and evaluated for single health issues such as nutritional intake³² in contrast to slightly broader education programmes in the United States of America, Nepal and India.^{33, 33} To our knowledge, this is the first time that a peer-led reproductive health education project spans the entire chain of obstetric care, ranging from the preconception to the postnatal health period.

Participants

The majority of participants were female which can be explained by (1) the pilot design (inclusion criteria: directed primary at women and secondary at men) and (2) the content of the meetings. Reproductive health is commonly perceived by both men and women as primarily “women’s” issues.^{35, 36} Nevertheless relatively high number of male adolescent participants can be explained by the fact that some of the meetings were organized in a school for intermediate vocational education. Three out of nine peer educators had a Moroccan background, which probably explains the higher proportion of Moroccan participants.

The higher number of first generation female participants is probably due to (1) the first generation immigrant status of most of the peer educators who might have more first generation females in their social network^{37,2} the low employment rates of first generation immigrants which could provide more time for participating in the sessions^{3,16,38} the higher educational level of second generation immigrants, who tend to feel that they are already knowledgeable enough³⁸ and (4) the involvement of several immigrant organizations in the recruitment.

Recruitment

In our study the ‘active’ recruitment methods were by far the most successful method, which is in line with other studies^{35,39,40} As expected, the passive methods (flyer and invitation by mail) were less successful, especially for first generation immigrants, probably due to insufficient language skills of these groups, which makes it difficult to read and understand text in Dutch.⁴¹⁻⁴³

Preferences for health care provider

Midwives, gynaecologists and general practitioners (GPs) are the designated professionals to offer preconception care in the Netherlands.⁴⁴ About 45% of the participants had a preference for seeing a midwife, whilst about the same percentage of the participants preferred a GP. A cross-sectional study found that 70% of the population of one of the districts of Rotterdam preferred a GP.⁴⁵ Our study showed that GPs were also the mostly preferred choice for the first booking visit during pregnancy. Possible reasons for this are that (1) GPs are located in closer proximity than designated obstetric professionals (2) citizens are more familiar with GPs (3) ethnic minorities are less aware of the existence of midwifery care (in a non-hospital setting).¹³

Knowledge

Non-western ethnic minorities in the Netherlands tend to have low awareness of folic acid supplementation and of the negative effect of smoking during pregnancy.^{13,14} About half of our participants indicated that their knowledge of folic acid usage had increased after the educational meetings. This might suggest that the public campaigns and advice offered by governmental organizations and healthcare providers about folic acid use in the Netherlands did not fully reach our target group. The limited effectiveness of these methods might be caused by (1) the passive and impersonal nature of campaigns and (2) the lack of adaptation to people with low/intermediate educational levels.⁴⁶ In the educational meetings, participants learned about the negative effects of smoking before and during pregnancy. Despite of mass-media campaigns about the detrimental health effects of smoking for the general health, the meetings delivered new information.⁴⁷ As expected, the majority of the participants indicated that they heard new information about preconception care. Other studies have shown that preconception care is not a very well known type of care.^{48,49}

Points of improvement

Registration forms were only available in the Dutch language. This might have caused a barrier for participants with poor Dutch language proficiency. Four percent of the questionnaires were incomplete (missing of gender variable and missing of more than five respondent characteristics) that were excluded from the analysis. We cannot fully oversee the consequences that these omitted questionnaires have for results of this

study. However, given the small number of exclusions (4%) we do not expect a bias. For future research we recommend translating the forms in the relevant languages or deployment of research assistants who can primarily focus on assisting participants in filling in the forms.

CONCLUSION

The peer led educational format used in this study was successful in reaching and educating non-Western ethnic minorities - a typically underserved population - for reproductive health education. Cornerstones of the success were 1) the active recruitment strategies 'verbal advertising by organizations' and 'social network', 2) the involvement of bicultural peer educators as recruiters and 3) a customized knowledge transfer using an eclectic peer educational method.

Practice Implications

In line with the results of this pilot study, we recommend educational programmes to invest in: a) training of educators for peer education about peer education reproductive health; training of educators with a Central African and Eastern European background are highly needed in the Netherlands as well as native Dutch peer educator; b) recruitment for peer education by verbal advertising by organizations and social networks of peer educators.

Future research

This pilot study showed that it is possible to reach first and second generation non-Western ethnic minority groups via reproductive health peer education. The success of this pilot is the starting point for a scaling-up of this method to other cities in the nationwide perinatal health program called 'Healthy Pregnancy 4 ALL' which started in 2011.

We recommend the following future research: (1) a network study of how recruiters / educators use their social network to recruit participants and (2) a study on how community organizations such as churches, mosques, schools and community centres are able to recruit participants.

Acknowledgements

Data collection and recruitment of participants for the educational sessions for this study was carried out by the reproductive health peer educators. In cooperation with the community organisations in the deprived neighbourhoods of Rotterdam, two of the recruitment strategies were performed. 'Zorgcampus' was together with the Erasmus MC responsible for coaching, training and employing the peer educators. We would

like to thank the Rotterdam Centre for Research and Statistics (COS, www.cos.rotterdam.nl) for their cooperation.

REFERENCES

1. Peristat II (2004): EURO-PERISTAT project in collaboration with SCPE, EUROCAT and EURONEONET. European perinatal health report. Better statistics for better health for pregnant women and their babies in 2004. Available at: <http://www.europeristat.com/reports/european-perinatal-health-report2004.html> (accessed may 2012).
2. De Graaf, JP., Ravelli, AC., De Haan, MA., Steegers, EA., Bonsel, GJ., Living in deprived urban districts increases perinatal health inequalities. *J Matern Fetal Neonatal Medicine*. 2013; 26 (6) 473-81.
3. Poeran, J., Denktas, S., Birnie, E., Bonsel, J., Steegers, EAP. Urban perinatal health inequalities. *J Mater Fetal Neonatal Medicine*. 2010; 24(4):643-6.
4. BOS Office Research and Statistics Amsterdam. (2012), [Dutch: Population by ethnic group] Available at: <http://www.os.amsterdam.nl/feiten-en-cijfers/>. (Accessed june 2012).
5. Agyemang, C., Vrijkotte, TG., Droomers, M., van der Wal, MF., Bonsel, GJ., Stronks, K., The effect of neighbourhood income and deprivation on pregnancy outcomes in Amsterdam, The Netherlands. *J Epidemiol Community Health*. 2009; 63(9):755-60.
6. Goedhart, G., van Eijsden, M., van der Wal, MF., Bonsel, GJ., Ethnic differences in preterm birth and its subtypes: the effect of a cumulative risk profile. *BJOG*. 2008; 115(6):710-9.
7. De Graaf, JP., Steegers, EA., Bonsel, GJ., Inequalities in perinatal and maternal health. *Curr Opin Obstet Gynecol*. 2013; 25:98-108.
8. Mackenbach, JP., Karanikolos, M., McKee, M., Health in Europe 1. The unequal health of Europeans: successes and failures of policies. *Lancet*. 2013; Mar 30;381 (9872):1125-34.
9. Andrulis, DP., Access of Care Is the Centerpiece in the Elimination of Socioeconomic Disparities in Health. *Ann Intern Med*. 1998; 412-416
10. Stronks, K., Ravelli, AC., Reijneveld, SA., Immigrants in the Netherlands: Equal access for equal needs? *J Epidemiol Community Health*. 2001; 55:691-692.
11. Lindström, M., Sundquist, J., Östergren, P-O., Ethnic differences in self-reported health in Malmö in southern Sweden. *J Epidemiol Community Health*. 2001; 55:97-103.
12. Burnes Bolton, L., Giger, JN., Georges, CA., Structural and racial barriers to health care. *Annual Review of Nursing Research*. 2004; 22(1):39-58.
13. Alderliesten, ME., Vrijkotte, TG., van der Wal, MF., Bonsel, GJ., Late start of antenatal care among ethnic minorities in a large cohort of pregnant women. *BJOG*. 2007; 114(10):1232-9.
14. Choté, AA., Koopmans, GT., Redekop, WK., de Groot, CJ., Hoefman, RJ., Jaddoe, VW., Hofman, A., Steegers, EA., Mackenbach, JP., Trappenburg, M., Foets, M., Explaining Ethnic Differences in Late Antenatal Care Entry by Predisposing, Enabling and Need Factors in the Netherlands. The Generation R Study. *Matern Child Health J*. 2010; June 9.
15. Timmermans, S., Jaddoe, VW., Mackenbach, JP., Hofman, A., Steegers-Theunissen, RP., Steegers, EA., Determinants of folic acid use in early pregnancy in a multi-ethnic urban population in The Netherlands: the Generation R study. *Prev Med*. 2008; 47:427-32.
16. Temel, S., Birnie, E., Voorham, AJJ., Bonsel, GJ., Steegers, EAP., Denktas, S., Determinants of the intention of preconception care use: lessons from a multi-ethnic urban population in the Netherlands. *Int J Public Health*. 2012; Aug;8 1-10.
17. Fransen, MP., Wildschut, H., Vogel, I., Mackenbach, J., Steegers, E., Essink-Bot, ML., Information about prenatal screening for Down syndrome: ethnic differences in knowledge. *Patient Educ Couns*. 2009; 77(2):279-88.

18. Denктаş, S., Bonsel, GJ., van der Weg, EJ., Voorham, AJJ., Torij, HW., De Graaf, JP., Wildschut, HJ., Peters, IA., Birnie, E., Steegers, EAP, An urban perinatal health programme of strategies to improve perinatal health. *Matern Child Health J.* 2011; 16 (8) 1553-8.
19. Hoppensteyn, M. (2009). [Dutch: Rotterdam population prognoses 2010-2025]. *COS Rotterdam Centre for Research and Statistics*. Available at: <http://www.rotterdam.nl/COS/publicaties/Vanaf%202005/08-2926.Bevolkingsprognose%20Rotterdam%202010-2025.pdf>. (Accessed may 2011).
20. Hoppensteyn, M. (2011), [Dutch: Factsheet, population monitor, april 2011] *COS Center for Research and Statistics Rotterdam*; Rotterdam, Netherlands.
21. Turner, G., Shepard, J., A method in search of theory: peer education and health promotion' *Health Educ Res.* 1999 ;14(2):235-247.
22. Lee, RE., McGinnis, KA., Sallis, JF., Castro, CM., Chen, AH., Hickman, SA. Active vs. passive methods of recruiting ethnic minority to a health promotion program. *Ann Behav Med.* 1997; 19:378-384.
23. CBS *Statistics Netherlands* (2000). [Dutch: Standard definition immigrant] Available at: <http://www.cbs.nl/NR/rdonlyres/26785779-AAFE-4B39-AD07-59F34DCD44C8/0/index1119.pdf>. (Accessed june 2012).
24. Poeran, J., Maas, AF., Birnie, E., Denктаş, S., Steegers, EA., Bonsel, GJ., Social deprivation and adverse outcomes among Western and non-Western pregnant women in a Dutch urban population. *Soc Sci Med.* 2013; 83:42-9.
25. Municipality of Rotterdam, Social Index Score, (2012), Available at: http://www.rotterdam.nl/tekst_sociale_index_centrum. (Accessed july 2012).
26. COS. *Rotterdam Centre for Research and Statistics* (2012). Rotterdam Social Measured [Dutch] Available at: <http://www.rotterdam.nl/DG%20Centrum/Sociale%20Index%202012.pdf>. (Accessed july 2012).
27. COS. *Rotterdam Centre for Research and Statistics* (2011). Customized data request: Rotterdam neighborhood birth rates of non-Western women aged between 18 and 42. *Rotterdam Centre for Research and Statistics*. Rotterdam; 2011.
28. RIVM (2013), [Dutch: What is the effect of prevention in the Netherlands?] National Compass Public Health. Available at: <http://www.nationaalkompas.nl/preventie/bereik/> and <http://www.nationaalkompas.nl/algemeen/menu-rechts/english/>. (Accessed january 2013).
29. ZonMW (2011),. [Dutch: The future of an intercultural preventive for mental health care]. Available at: http://www.zonmw.nl/uploads/tx_vipublicaties/Rapport_ggz_ZonMw.pdf. (Accessed november 2012).
30. Owens, MD., Kieffer, EC., Chowdhury, FH., Preconception Care and Women with or at Risk for Diabetes: Implications for Community Intervention. *Matern Child Health J.* 2006; 10 S137-S141.
31. Rempel, LA., Moore, KC., Peer-led prenatal breast-feeding education: a viable alternative to nurse-led education. *Midwifery.* 2012; 28(1):73-9.
32. Boyd, NR., Windsor, RA. (2003), A formative evaluation in maternal and child health practice: the Partners for Life Nutrition Education Program for pregnant women. *Matern Child Health J.* 2003; 7(2):137-143.
33. Massey, Z., Rising, SS., Ickovics, J., Centering Pregnancy group prenatal care: Promoting relationship-centered care. *JOGNN.* 2006; 35(2):286-194.
34. Tripathy, P., Nair, N., Barnett, S., Mahapatra, R., Borghi, J., Rath, S., Gope, R., Mahto, D., Sinha, R., Lakshminarayana, R., Patel, V., Pagel, C., Prost, A., Costello, A., Effect of a participatory

- intervention with women's groups on birth outcomes and maternal depression in Jharkhand and Orissa, India: a cluster-randomised controlled trial. *Lancet*. 2010; 375(9721):1182-1192.
35. Murphy Tighe, S., An exploration of the attitudes of attenders and non-attenders towards antenatal education. *Midwifery*. 2010; 26(3):294-303.
 36. Iliyasu, Z., Abubakar, IS., Galadanci, HS., Aliyu, MH., Birth preparedness, complication readiness and fathers' participation in maternity care in a northern Nigerian community. *Afr J Reprod Health*. 2010; 14(1):21-32.
 37. Martijn, C., de Vries, NK., Voorham, T., Brandsma, J., Meis, M., Hospers, HJ., The effects of AIDS prevention programs by lay health advisors for migrants in The Netherlands. *Patient Educ Couns*. 2004; 53:157-165.
 38. CBS *Statistics Netherlands* (2004), [Dutch: Second generation immigrants more successful than first generation] Statistics Netherlands. Available at: <http://www.cbs.nl/nl-NL/menu/themes/arbeid-sociale-zekerheid/publicaties/artikelen/archief/2004/2004-1611-wm.htm>. (Accessed february 2014).
 39. Velott, DL., Baker, SA., Hillemeier, MM., Weisman, CS., Participant recruitment to a randomized trial of a community-based behavioral intervention for pre- and interconceptional women findings from the Central Pennsylvania Women's Health Study. *Womens Health Issues*. 2008; 18:217-224.
 40. El-Khorazaty, MN., Johnson, AA., Kiely, M., El-Mohandes, AA., Subramanian, S., Laryea, HA., Murray, KB., Thornberry, JS., Joseph, JG. (2007), Recruitment and retention of low-income minority women in a behavioral intervention to reduce smoking, depression, and intimate partner violence during pregnancy. *BMC Public Health*. 2007; 6(7):233.
 40. Denктаş, S., Koopmans, G., Birnie, E., Foets, M., Bonsel, G., Ethnic background and differences in health care use: a national cross-sectional study of native Dutch and immigrant elderly in the Netherlands. *Int J Equity Health*. 2009; 1-9.
 42. Ng, C., Newbold, KB., Health care providers' perspectives on the provision of prenatal care to immigrants. *Cult Health Sex*. 2011; 13(5):561-574.
 43. Thomas, PE., Beckmann, M., Gibbons, K., The effect of cultural and linguistic diversity on pregnancy outcomes. *Aust N Z J Obstet Gynaecol*. 2010; 50:419-422.
 44. van der Zee, B., de Beaufort, I., Temel, S., de Wert, G., Denктаş, S., Steegers E., Preconception care: an essential preventive strategy to improve children's and women's health. *J Public Health Policy*. 2011; 32(3):367-79.
 45. Programme Ready for a Baby (2011), [Dutch: Report, baseline measurement preconception care district Feijenoord, Rotterdam]. *Program Ready for a Baby Rotterdam*; 22.
 46. de Walle, HEK., van der Pal, KM., de Jong – van den Berg, LTW., Jeeninga, W., Schouten, JSAG., de Rover, CM., Buitendijk, SE., Cornel, MC., Effect of mass media campaign to reduce socioeconomic differences in women's awareness and behaviour concerning use of folic acid: cross sectional study. *BMJ*. 1999; (319(7205)):291-292.
 47. STIVORO (2010). ITC Netherlands Survey: Report on Smokers' Awareness of the Health Risks of Smoking and Exposure to Second-Hand Smoke, Netherlands.
 48. Coonrod, DV., Bruce, NC., Malcolm, TD., Drachman, D., Frey, KA., Knowledge and attitudes regarding preconception care in a predominantly low-income Mexican American population. *Am J Obstet Gynecol*. 2009; 200(6):686.e 1-7.
 49. Frey, KA., Files, JA., Preconception healthcare: what women know and believe. *Matern Child Health J*. 2006; 10:S73-S77.