Promoting contraceptive use among female rural-to-urban migrants in Qingdao, China: a comparative impact study of worksite based interventions.

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Promoting contraceptive use among female rural-to-urban migrants in Qingdao, China: a comparative impact study of worksite based interventions.

ABSTRACT

Background We conducted a comparative study in worksites to assess the impact of sexual health promoting interventions on contraceptive use among female rural-to-urban migrants.

Study design In Qingdao ten manufacturing worksites were randomly allocated to a standard package of interventions (SPI) and an intensive package of interventions (IPI). The interventions ran from July 2008 to January 2009. Cross-sectional surveys at baseline and end line assessed the sexual behaviour of young female migrants. To evaluate the impact of the interventions we assessed pre- and post time trends.

Results From the SPI group 721 (baseline) and 615 (end line) respondents were considered. Out of the IPI group we included 684 and 603 migrants. Among childless migrants, self-reported contraceptive use increased significantly after SPI and IPI (adjusted odds ratio [aOR]= 3.23; 95% confidence interval [CI]=1.52-6.84; p<0.01 and aOR=5.81; 95% CI=2.63-12.80; p<0.001, respectively). Childless migrants older than 22 years reported a greater use after IPI than after SPI.

Conclusion Implementing current Chinese sexual health promotion programmes at worksites is likely to have a positive impact on migrant women working in the manufacturing industry of Qingdao. More comprehensive interventions seem to have an added value if they are well targeted to specific groups.
INTRODUCTION

In China, an estimated 147 million people have migrated from rural to urban areas over the last two decades, in search of gainful employment. Most of these internal migrants are employed in manual labour, including construction, manufacturing and service industries. Migrants hope to reap the benefits of China’s booming economy and to improve their quality of life.

However, migration to cities does not necessarily lead to greater wellbeing. Sexual and reproductive health (SRH), for instance, seems to be negatively affected by migration. Rural-to-urban migration is reported as a contributing factor to the spread of HIV in China. Previous studies have demonstrated poorer SRH indicators among internal migrants compared to residents. Higher rates of induced abortions, HIV and sexually transmitted infections (STIs) have been observed within migrant populations. Migrants are also faced with a series of obstacles in accessing SRH services. One barrier for access is the high cost of health care for migrants in the city. Most migrants are not covered by health insurance, which implies greater out-of-pocket expense. However, SRH vulnerability varies among rural-to-urban migrants in China. In a previous article we showed that, among migrants, being unmarried, childless, uninsured for health care and less educated are risk factors for having an unmet need for contraception. The increased vulnerability for an unintended pregnancy has particular implications concerning social inequity in a country with strict regulations on family size. In all major cities of China, a one-child policy has been strictly enforced since 1979.

Scientists and politicians recognise that SRH policies should address the contraceptive need of migrants in China. However, how to address those needs is unclear and underexplored. We found only one pilot study that described an intervention promoting contraceptive use among migrants. In light of the lack of rigorous operational research on
strategies aimed at improving SRH among migrant workers in China, the YOLAMI (Young Labour Migrants in Chinese cities) study was designed to develop and test an intervention strategy aimed to improved contraceptive use among rural-to-urban migrants.

METHODS

Setting

Qingdao is an economically important city with 1.2 million internal migrants and 8,456,100 residents\(^\text{15}\). Most internal migrants in the city are employed in the manufacturing industry. The Young Labour Migrant (YOLAMI) research in Qingdao targeted female factory workers.

Study design

A study comparing the impact of interventions at worksites was conducted. A *worksite* is defined as a unit within a company producing the same goods. The worksites were randomly allocated to a *standard package of interventions* (SPI) or an *intensive package of interventions* (IPI). We assessed attitudes and SRH behaviour among female migrants through cross-sectional surveys at worksites before and after interventions.

The number of worksites was calculated using a sample size software package for a cluster randomised trial with binary outcome (Liu X. et al., Optimal design for multilevel and longitudinal research - Version 1.77.). We used a study of unmarried youths aged 15-24 in Shanghai to calculate the minimum sample size\(^\text{16}\). We assumed a median cluster size of 200 sexually active respondents and an intra-cluster correlation of 0.20. Consequently, ten clusters were required to detect a significant increase in contraception use from 40% to 50% or more with 80% power at 5% significance level.
Recruitment

An exhaustive list of 238 manufacturing worksites was obtained from the district administration. From this list we selected worksites located within a range of 15 km from a collaborating health facility, which employed between 300 and 700 female migrants. In total, 24 worksites were identified corresponding to those criteria; they were matched into 12 pairs using criteria such as the production goods of the worksites, the number of female migrants, the ratio of unmarried to married female migrants, and the distance to a health centre. Three worksites declined to participate and were excluded together with the matched pair. From the nine remaining pairs five were randomly selected. Finally, from each pair one worksite was allocated by coin tossing to the SPI arm and the other to the IPI arm (Figure 1). The interventions continued for six months from July 2008 until January 2009. At each worksite, all female workers between 18 and 29 years old who originated from rural areas were given the possibility to be enrolled in a pre- and post-intervention survey. Participation was voluntary, and workers were assured that not participating would not have any consequences for their employment.

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Interventions

The intervention objective of both packages was to promote the consistent use of modern family planning (FP) methods among migrant workers.

The SPI corresponded to the common SRH promotion programmes in China and consisted of the monthly distribution of brochures to migrants, monthly free condom distribution and informative posting at public places in the worksites (four sets of posters that were changed monthly).
In developing the content of IPI, we took into account the results of the baseline survey and additional qualitative research that explored the SRH needs of Chinese migrant workers\textsuperscript{10,17}. The intermediary objectives of this package were to facilitate access to SRH information and services, to enhance open communication on sexuality and to promote knowledge transfer by health providers and peer educators. The interventions addressed both married and unmarried migrants, and combined the standard package with group activities and activities targeting individual migrant workers. A hotline was installed that offered SRH counselling over the phone, and all workers received VIP cards which entitled them to pay less for sexual and reproductive health services. Health providers from a local FP service visited the worksites fortnightly. During each visit, the health care professionals gave a thirty-minute lecture on an SRH theme; an informative video was shown; migrant workers got the opportunity for a face-to-face consultation with a health provider; and an informative and instructive session was organised for selected peer educators. Except for the lectures, all activities took place outside working hours, and the workers were free to participate or not. In each worksite, about 30 peer educators were trained. They were encouraged to discuss SRH issues with their colleagues in an informal way.

**Data collection**

Data were collected through cross-sectional inquiries which were conducted before (baseline) and after (end line) the interventions. At a time arranged with management, trained interviewers visited the worksites. During lunch and dinner, interested workers presented themselves for an interview in a confidential room. Interviewers gave a detailed description of the study purpose and design, and invited all female migrants aged between 18 and 29 to participate in the survey. The respondents were given the choice either to fill out the questionnaire themselves or to be assisted by an interviewer. Small and locally appropriate
gifts (e.g., an umbrella) were offered for participation in the study. All participants gave written informed consent.

The questionnaire gathered information on socio-demographic characteristics, knowledge, attitudes, and behaviour. With regard to behaviour, respondents were asked to report about the last six months prior to the interview. The post-intervention questionnaire was identical to the pre-intervention questionnaire.

The questionnaire was designed by a study steering committee including Chinese and European investigators. It was based on the illustrative questionnaire for interview-surveys with young people conceived by John Cleland for the Word Health Organization\textsuperscript{18}. The questionnaire was developed in English, translated into Chinese and, subsequently, translated back into English by another researcher. The translations were done without knowledge of the study specifics or insight into other study documents. Both English versions were compared, and inconsistencies were resolved by modifying the Chinese version. The questionnaires were piloted among a convenient sample of 137 female migrant workers.

Completed questionnaires were entered into the database Epi info 3.0 (CDC, Atlanta, GA, USA) in China. Data were analysed using SPSS 16.0 (SPSS Inc. Chicago, IL, USA) and STATA 11.2 (Stata corporation, College Station, TX, USA).

Outcome variables

Consistent contraceptive use is the primary outcome variable. This dichotomous variable reflects self-reported continuous use of a modern contraceptive over a six-month period. Sterilisation, condoms, intrauterine devices (IUDs), oral contraceptives and progestogen-only methods are all considered modern contraceptives. The secondary outcomes are the indicators related to health-seeking behaviour, and the ease of communication about SRH with friends and a doctor.
Statistical analysis

Baseline characteristics of women were summarised with counts (percentages) for categorical variables, mean (standard deviation [SD]) for normally distributed continuous variables, or median (interquartile [IQR]) for other continuous variables.

Marginal logistic regression models were applied to evaluate the impact of the interventions among sexually active respondents who had no current intention to become pregnant. We analysed separately the outcome of childless migrants and migrant mothers as these groups differed considerably in contraceptive needs. Specifically, we assessed the null hypothesis of equal pre-post time trends in the reported consistent contraceptive use across both study arms. All models were fitted using generalised estimating equations with exchangeable working correlation. In addition to the simple model with only intervention arm, time and the interaction term as predictor variables, we tested multiple expanded models, including terms and interaction terms related to age, marital status and duration of stay in the city. The Akaike information criterion (AIC) was used to measure the relative goodness of fit of the statistical models. All reported p-values and confidence intervals (CIs) are corrected for within-cluster correlation.

Ethical considerations

The study was approved by the ethical committee of the National Research Institute for Family Planning Beijing, (12 Da Hui Si, Hai Dian District, 100081 Beijing, China) and the ethical committee of Ghent University Hospital, Belgium, on 12 August 2008.

RESULTS

Figure 1 shows the trial profile. In the SPI arm 1762 and 1568 eligible workers, respectively, completed the baseline and end line survey. Within the IPI arm 1759 (baseline) and 1579 (end
female migrants filled out the questionnaires adequately. For the present analysis we took into account the data from sexually active women without pregnancy intention. We only included respondents from the end line-survey who confirmed that they also completed the baseline survey in order to omit women who entered the study late and had not been exposed to the full intervention. Consequently, 721 and 615 respondents of the SPI arm were considered for, respectively, baseline- and end line. From the IPI group, the data of 684 (baseline) and 603 (end line) respondents were analysed.

We studied the outcomes separately for respondents with and without children. Table 1 shows some characteristics of participants from both study arms at baseline and end line. Age, age of sexual debut and marital status were similar in the different groups, but differences were noted in years of education and duration of residence in the city. Migrant mothers from the SPI group had more years of education compared to their peers from the IPI group.

*Note to the Publisher: Insert Table 1 about here.*

Consistent contraceptive use and all secondary outcomes increased by the end of the interventions in both study arms among respondents with and without children (Table 2). Table 3 shows the adjusted odd ratios (aOR) of the reported consistent contraceptive use that is calculated within the best fitting model. Among childless migrants, self-reported consistent contraceptive use increased significantly after intervention in both the SPI and IPI study arm ([aOR]= 3.23; 95% confidence interval [CI]=1.52-6.84; \( p<0.01 \) and aOR=5.81; 95% CI=2.63-12.80; \( p<0.001 \), respectively). The interaction term of age and standard intervention (not shown in the table) suggests that the effect of the SPI was smaller in older participants (aOR of intervention effect by one-year increment =0.86; 95% CI=0.77-0.95; \( p<0.01 \)). Consequently, the group of childless migrants older than 22 years of age did not report a better contraceptive use after the SPI. Only after the IPI was there an improvement resulting
in a significant difference of consistent contraceptive use at end line comparing IPI and SPI (aOR=2.16; 95% CI=1.23-3.79; p<0.01). The factors related to the contraceptive use of migrant mothers were different from those related to the childless migrants. Consistent use was lower among migrant mothers with less than seven years education compared to migrant mothers with a longer education time (aOR=0.66; 95% CI=0.52-0.83; p<0.001). The contraceptive use at end line among migrants with children did not differ among the study arms (aOR=0.95; 95% CI=0.62-1.45).

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We also studied secondary outcomes among sexually active respondents without current pregnancy intention (table 4). Participants from both study arms reported being more comfortable when communicating about SRH with friends at the end of the study. The larger impact of the IPI was not statistically significant. After the IPI more childless migrants reported feeling more at ease talking with a doctor than after the SPI (aOR=2.52; 95% CI=1.23-5.17; p<0.05). The multivariate model shows that unmarried women felt less at ease with a doctor (not shown in the table, aOR=1.62; 95% CI=0.45-0.89; p=0.008). Among migrant mothers, the ease of talking with a doctor improved after both interventions. This outcome was not significantly better after the IPI. The access to SRH services among childless migrants improved after both interventions but did not differ among the two intervention arms. Conversely, migrant mothers subjected to the IPI were significantly more likely to access a health service when having a SRH problem than their peers from the SPI arm (aOR after IPI vs. after SPI=1.98; 95% CI=1.06-3.69; p<0.05).
DISCUSSION

Findings and interpretation

Our study provides indications concerning the differential impact of a simple and a complex intervention in worksites. The multi-component intervention including face-to-face counselling, peer education and preferential prices for SRH services improved the contraceptive use among childless migrants older than 22. Additionally, we found that a comprehensive intervention had an additional impact compared to a standard intervention on improving ease of discussing SRH with a doctor for childless migrants and on the use of SRH services among migrant mothers.

Considering only the SPI arm, the data show that contraceptive use at end line increased among female migrants except for childless migrants aged 23 to 29. The SPI was similar to common SRH promotion programmes in China and consisted of the monthly distribution of brochures among migrants, a monthly free condom distribution, and informative posting at public places in the worksites. The absence, for ethical reasons, of a non-interventional control group prevents us from drawing hard conclusions on the effect of standard interventions alone. However, the results of the study suggest that interventions that are comparatively simple and low-priced may achieve an impact on contraceptive use.

The impact of the standard intervention on contraceptive use decreased by age. It seems that behavioural change is more easily achieved among young people in their early twenties than among those in their mid-twenties. Probably it is easier to establish a desired pattern of sexual behaviour from the onset of sexual involvement than it is to change pre-existing habits.19,20

Finally, our study demonstrates that worksites are an effective venue for SRH interventions targeting internal migrants in China.
Study strengths and limitations

The research primarily demonstrates how to address the SRH of a million internal migrants employed in manufacturing worksites in Qingdao. By extension, we believe that the study generates valuable insight for adjusting national health policies to the SRH needs of internal migrants.

Yet the specific design of this study needs to be taken into account when interpreting the results. The study was limited to one city, to a specific labour sector and to migrant workers labouring during the day, who voluntarily presented themselves for the surveys. Specific criteria were applied for the selection of worksites and four of the 18 worksites refused to participate without giving a clear justification. Furthermore, the health services in Qingdao are considered the best in the country which might have affected the quality of the health talks. Those aspects might have biased the results; moreover, the results can hardly be generalised to the whole of China.

The study compared data of cross-sectional surveys before and after interventions. The comparison of data from the same respondents before and after interventions would have strengthened the study results. Unfortunately, it was not possible to collect longitudinal data as the collection of personal data allowing identification of respondents was not ethically approved.

Within the scope of this project self-reported outcomes were the only achievable sources for measuring behaviour change. Self-report bias cannot be excluded but is unlikely to be the single cause of the marked differences between pre- and post-intervention values.

Despite randomisation, the baseline rates of the outcome variables differed statistically between the intervention groups. This is a likely consequence of having selected a limited number of clusters. The effect on the estimate of the intervention impact was corrected by
employing the Generalised Estimating Equations (GEE) statistical method and by including baseline characteristics and the interaction term intervention type and time in the model.

For ethical reasons it was not justifiable to include a no-intervention group as control. This limitation prevented us from identifying factors other than the intervention that could have influenced the results. For instance, just the fact of having answered the baseline questionnaire could account for a change at end line. However, the marked differences between pre-and post-intervention values and the differences between the two intervention groups allowed us to draw reliable conclusions.

The study was too short to permit measurement of long-term impact and the effect on more direct SRH indicators as unplanned pregnancies. The duration of the research was constrained by budgetary affordability. The evaluation of a long-term impact would have strengthened the conclusions of the study.

There could have been contamination between arms, but serious contamination is unlikely as clusters were geographically separated and the total sample size was small compared with the overall population, so the likelihood of participants having contacts with or moving to worksites from another study arm was low.

Results from other studies
Similarly to our research, several interventional studies show a positive impact on contraceptive use. A systematic review of randomised controlled trials examined theory-based interventions for improving contraceptive use\textsuperscript{21}. According to that review four of the nine trials assessed showed more or better self-reported contraceptive use in the intervention group than in the comparison group and 14 of 20 studies showed some positive results with regard to condom use among intervention groups. A community-based intervention in suburban Shanghai had positive influences on contraceptive practice and condom use among unmarried young females and males\textsuperscript{22}. 

URL: http://mc.manuscriptcentral.com/dejc  Email: journal@contraception-esc.com
That a minimal intervention already may have an impact on contraceptive use has also been reported by Jemmott et al. who demonstrated a decrease in unprotected sexual intercourse among African American women after a single-session intervention\textsuperscript{23}.

The effectiveness of using worksites for health promotion programmes has also been established in an international review on behavioural change\textsuperscript{24}. We found one Chinese study that described a single pilot workplace intervention targeting unmarried female migrants\textsuperscript{14}.

**Implications for policy makers**

This study may contribute to Chinese health policies as it provides scientific arguments for the design of effective interventions that are well targeted to specific migrant groups with well-defined objectives. Implementing the current Chinese sexual health promotion programmes at worksites is likely to have a positive impact on the contraceptive use of the youngest female migrant workers. More comprehensive interventions -including face-to-face counselling, peer education and preferential prices for SRH services- seem to have an added value: on contraceptive use among childless migrants in their mid-twenties; on the ease with which childless migrants communicate about SRH with a doctor; and on utilisation of SRH services by migrant mothers.

**Future research**

Sexual and reproductive health cannot be reduced to the use of contraceptives and SRH services alone. SRH encompasses a diverse range of issues including, but not limited to, sex and gender identities and roles, gender norms, sexual orientation, tolerance, respect, pleasure, intimacy, reproductive awareness and self-efficacy. Fulfilment within these areas is not easy to evaluate. Further quantitative and qualitative research could reveal the impact of intervention strategies on other SRH outcomes. Additional research including other cities and
focusing on the design process and cost-effectiveness of interventions is useful for scale-up
new SRH programmes for Chinese rural-to-urban migrants.

Conclusions

The Young Labour Migrant (YOLAMI) study provides arguments that the implementation of
current Chinese sexual health programmes at worksites might reduce the contraceptive needs
of young female migrants. More comprehensive interventions seem to have an added value if
they are well targeted to specific groups.

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**Table 1:** Characteristics of participants.

|                        | Childless migrants | Migrants with child(ren) |     |     |     |     |     |     |     |     |     |
|------------------------|--------------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
|                        | SPI (N=221)        | IPI (N=208)              | SPI (N=204) | IPI (N=154) | SPI (N=500) | IPI (N=476) | SPI (N=154) | IPI (N=154) | SPI (N=411) | IPI (N=449) |
| **Years of age, mean (SD)** | 24.4 (3.1)        | 23.5 (2.6)               | 24.0 (2.6)   | 24.1 (2.4)   | 26.8 (1.8)   | 27.0 (2.0)   | 26.4 (2.1)   | 27.3 (1.7)   |
| **Age of sexual debut, mean in years (SD)** | 21.5 (2.3)        | 21.1 (2.0)               | 20.9 (2.1)   | 21.5 (1.9)   | 22.4 (1.7)   | 22.3 (1.9)   | 22.1 (2.0)   | 22.7 (2.1)   |
| **Unmarried, n (%)**    | 74/221 (33)        | 95/208 (46)              | 70/204 (34)  | 61/154 (40)  | 500/500 (100) | 476/476 (100) | 411/411 (100) | 449/449 (100) |
| **Less than seven years of education, n (%)** | 115/218 (53)      | 123/206 (60)             | 92/204 (45)  | 65/154 (42)  | 379/499 (76) | 234/469 (50) | 300/411 (73) | 252/449 (56) |
| **Months of residence in the city, median (IQR)** | 24.9 (30)         | 35.0 (49)                | 20.8 (20)    | 29.0 (30)    | 22.8 (35)    | 44.2 (82)    | 22.9 (30)    | 33.0 (60)    |

SPI = Standard package of interventions; IPI = Intensive package of interventions; SD = Standard deviation; IQR = Interquartile range
Table 2: Baseline and endline outcomes by intervention group

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<th>Childless migrants</th>
<th>Migrants with child(ren)</th>
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<tr>
<td></td>
<td>SPI Baseline</td>
<td>SPI End line</td>
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<tr>
<td>Consistent contraceptive use, n/N (%)</td>
<td>122/220 (55)</td>
<td>130/204 (64)</td>
</tr>
<tr>
<td>Ease in communicating about SRH with friends, n/N (%)</td>
<td>95/218 (44)</td>
<td>131/204 (64)</td>
</tr>
<tr>
<td>Ease in communicating about SRH with a doctor, n/N (%)</td>
<td>140/218 (64)</td>
<td>152/204 (75)</td>
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<tr>
<td>Accessed health service when sexual health problem, n/N (%)</td>
<td>46/103 (45)</td>
<td>60/86 (70)</td>
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SPI= Standard package of interventions; IPI = Intensive package of interventions; SRH=Sexual and reproductive health
Table 3: Adjusted odds ratios [aORs] with 95% confidence intervals [CIs] from logistic regression analysis assessing association between consistent contraceptive use and intervention type.

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<tr>
<td></td>
<td>18-29 years</td>
<td>18-22 years</td>
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<tr>
<td>Following standard intervention</td>
<td>3.23**</td>
<td>1.52-6.84</td>
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<tr>
<td>Following intensive intervention</td>
<td>5.81***</td>
<td>2.63-12.80</td>
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<tr>
<td>Age (years)</td>
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<td>1.04-1.22</td>
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<tr>
<td>Unmarried</td>
<td>0.81</td>
<td>0.60-1.10</td>
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<tr>
<td>Less than seven years of education</td>
<td>0.81</td>
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<td>Time living in the city (months)</td>
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<td>0.99-1.01</td>
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<tr>
<td>After intensive intervention versus after standard intervention</td>
<td>1.80†</td>
<td>0.99-3.28</td>
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***p<0.001; **p<0.01; *p<0.05; †p between 0.05 and 0.1
Table 4: Adjusted odds ratios [aORs] with 95% confidence intervals [CIs] from logistic regression analysis assessing association between secondary SRH outcomes and intervention type adjusted to age, marital status and years of education.

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<th>Migrants with child(ren)</th>
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<td>aOR</td>
<td>95% CI</td>
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<td>Ease in communicating about SRH with friends</td>
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<tr>
<td>following standard intervention</td>
<td>2.28***</td>
<td>1.54-3.39</td>
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<tr>
<td>following intensive intervention</td>
<td>2.35***</td>
<td>1.48-3.75</td>
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<tr>
<td>after intensive intervention versus after standard intervention</td>
<td>1.03</td>
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<td>Ease in communicating about SRH with doctor</td>
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<td>following standard intervention</td>
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<tr>
<td>following intensive intervention</td>
<td>3.73***</td>
<td>2.10-6.63</td>
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<tr>
<td>after intensive intervention versus after standard intervention</td>
<td>2.52*</td>
<td>1.23-5.17</td>
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<tr>
<td>Accessed health service when sexual health problem</td>
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<tr>
<td>following standard intervention</td>
<td>3.12***</td>
<td>1.67-5.82</td>
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<tr>
<td>following intensive intervention</td>
<td>2.65**</td>
<td>1.28-5.45</td>
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<tr>
<td>after intensive intervention versus after standard intervention</td>
<td>0.85</td>
<td>0.33-2.21</td>
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***p <0.001; **p<0.01; * p <0.05; † p between 0.05 and 0.1