# Barriers to cervical screening participation in high risk women

## Abstract

*Aim:* Women aged 25-35 years, for whom cervical cancer is most problematic, are least likely to participate in the cervical screening programme. Therefore, identifying barriers to screening participation in this high risk group is essential. *Subject and methods:* A sample of 430 women completed an electronic survey of their cervical screening history and answered questions on sociodemographic, behavioural, attitudinal, and informational barriers to cervical screening uptake. Logistic regression was used to predict cervical screening non attendance. *Results:* Women with more than 10 sexual partners in their lifetime were more likely, but women from ethnic minorities, less likely to participate in the cervical screening programme. Women unaware of the recommended screening interval were also less likely to be screened, as were women who believed that screening is a test for cancer. Screening was also less likely among women who endorsed the belief that screening in the absence of symptoms is unnecessary. *Conclusion:* These data highlight poor knowledge, both in terms of the recommended screening interval and purpose of cervical cancer screening in this high risk group. As such, interventions that target these informational barriers might be most effective for increasing cervical screening uptake in this high risk group.

**Keywords:** cervical cancer; cervical screening participation; ethnic minority; informational barriers

## Introduction

The human papillomavirus (HPV), a sexually transmitted infection, has been shown to be an important risk factor in the development of cervical cancer. HPV types 16 and 18 in particular are found in around 70% of cases (Bang et al. 2012). Cervical cancer, which often produces no physical symptoms (CR-UK 2010), affects approximately 2700 women in the United Kingdom (UK) each year, resulting in around 800 deaths (NHSCSP 2012). However, cervical screening, a method of detecting premalignant abnormalities within the cervix, has been shown to markedly reduce morbidity and mortality associated with cervical cancer (Peto et al. 2004). Indeed, statistics indicate that screening prevents around 4000 cases of cervical cancer each year in the UK (NHSCSP 2012).

In the UK, women aged 25-64 years are eligible for free cervical screening every three to five years (CR-UK 2010). However, since 2009, and despite being freely available, screening coverage in the UK has fallen below the national target of 80% (NHSCSP 2012). Of particular concern are women aged 25-35 years who, despite being at greatest risk for cervical cancer (CR-UK 2010), are least likely to attend cervical screening appointments (Lancuck et al. 2010). Therefore, identifying barriers to cervical screening compliance in this at risk group is essential.

Research has demonstrated that screening attendance might vary according to sociodemographic factors. That is, participation failures have been observed in single (Waller, Wardle, & von Wagner, 2012), unemployed women (Olesen et al. 2012), and screening has also been shown to be less likely among women from ethnic minority (Amankwaha et al. 2009) and lower socioeconomic backgrounds (Franceschi et al., 2009). Participation failures have also been associated with risky lifestyle behaviours. Indeed, women who smoke (Hansen et al, 2011) and those who reported never using hormonal

contraception or condoms (Eaker et al. 2001) were less likely to be screened. Screening participation has also been shown to be poorer among women with a higher number of sexual partners in their lifetime (Tacken et al. 2006). Converging with these findings, attitudinal beliefs about the test, e.g., that it is associated with sexual promiscuity, have also been cited as important factors for non attendance (Lostao et al. 2001), as has fear, both of test itself (i.e., fear of embarrassment and/or pain) and its outcome (Oscarsson et al. 2008). Finally, practical challenges such as work and childcare commitments, and travel problems have also been cited as barriers to cervical screening participation (Waller et al. 2012).

To date, the majority of research has sought to identify deterrents for cervical screening participation in women generally. However, women aged 25-35 years, for whom cervical cancer is most problematic, are also least likely to attend for cervical screening. Therefore, indentifying barriers to cervical screening participation in this group is essential, and this was the aim of the present study.

## Methods

### Participants

A sample of 582 consenting women, who were recruited via adverts placed on social media sites, responded to an electronic survey asking about their cervical screening history. Women also answered questions relating to known barriers for participation in preventive health screening programmes, and these included sociodemographic, behavioural, attitudinal and informational barriers. Full details of predictor variables have been included as supplementary information. This study and all its procedures were approved by the Faculty of Health and Life Sciences Ethics Committee. 127 women who failed to answer any survey questions were excluded, as were 20 women who did not report their screening history. Five women who could not remember their most recent screen were also excluded. Therefore, statistical analysis was conducted on a final sample of 430 participants.

The majority of participants were White British (N= 306, 71.16%), married or partnered (N = 266, 61.86%), had a postgraduate education (N = 244, 56.74%) and had no children (N = 338, 78.60%).

### Statistical analysis

The dependent variable was whether or not participants satisfied the National Health Service (NHS) criterion for attending cervical screening every third year. Non attendance was defined as having never attended, or attended, but not during the preceding three years. Predictors for screening non attendance were assessed using binary logistic regression. Listwise deletion was used to handle missing data. Model 1 contained the sociodemographic variables: age, ethnicity, education, income, relationship status and number of children. Model 2 contained the risky lifestyle behaviours: smoking, number of lifelong sexual partners, and age of first sexual experience. The final model contained informational and attitudinal factors. These included: the NHS criterion for screening attendance every third year, the belief that cervical screening is a test for cancer, the belief that screening in the absence of symptoms is unnecessary, fear of the test, perceived risk, intention, and practical issues.

**Results**

Preliminary analysis

The majority of participants were up-to-date with screening (N = 332, 77.21%), never smoked (N = 265, 61.63%), had 10 or fewer sexual partners in their lifetime (N = 321, 74.65%) and had their first sexual experience over 16 years of age (247, 57.44%). The majority knew that screening should occur every third year (N = 265, 61.63%), while 34 women (7.91%) believed that screening was annual, 95 women (22.09%) thought screening should take place every five or seven years, and 32 women (7.44%) were unsure how often screening should occur. The majority of women (N = 304, 70.70%) believed that cervical screening is a test for cancer.

Predicting non attendance

Table 1 (See end of manuscript) displays results of the logistic regression. The demographic model (model 1) accounted for 11% of the variance ($\chi^2$ (6) = 28.54, $p < 0.01$). In this model, women from ethnic minorities were less likely, but women in a relationship, more likely to be screened. The demographic and risky lifestyle model (model 2) accounted for 15% of the variance ($\chi^2$ (9) = 39.31, $p < 0.01$). In this model, ethnicity and relationship status remained significant. Data indicated that screening was more likely in women with children, and in women with more than 10 sexual partners in their lifetime. The model that contained the informational and attitudinal variables (model 3) accounted for 56% of the variance ($\chi^2$ (18) = 181.12, $p < 0.01$). In this model, ethnicity remained significant, as did number of lifelong sexual partners. However, relationship status and children became non-significant. Women unaware of the recommended screening interval were less likely to be screened, as were women who believed that cervical screening is a test for cancer. Screening was also less likely for women who endorsed the belief that screening in the absence of symptoms is unnecessary.

**Discussion**

Findings indicated that screening participation was generally good; indeed, 78% of women satisfied the NHS criterion for screening attendance every third year. However, women from ethnic minorities were less likely to be screened, a finding that dovetails neatly with other recently published work (Amankwaha et al. 2009). Women who were unaware of the NHS recommendation for screening every third year were also less likely to be screened, as were women who believed that cervical screening is a test for cancer. Screening was also less likely in women who endorsed the belief that screening in the absence of symptoms is unnecessary. These data, which highlight poor knowledge both of the recommended screening interval and purpose of screening, resonate with other recent studies that reported on screening inequalities characterised by informational issues (Wong et al. 2008). These data underscore the importance for overcoming informational barriers in his group. Indeed, in a recent study, the NHSCSP canvassed the views of 188 young women on ways to increase cervical screening uptake, and just under half commented that additional information on both cervical cancer and screening would be advantageous (NHSCSP 2012). To date, printed materials such as simple and tailored leaflets have yielded little in the way of benefits (Rimer 1999). Encouragingly, however, adaptive effects of group

based educational programmes on cervical screening participation have been observed (El-Hadad 2005), and future studies might look to corroborate and extend these findings.

Data further indicated that women with more than 10 sexual partners in their lifetime, and therefore, at increased risk for cervical cancer (CR-UK 2010), were more likely to attend for screening. These data, which contradict previous research that has observed an inverse association between risky lifestyle behaviours (i.e., number of sexual partners) and screening participation (Tacken et al. 2006), therefore are encouraging.

Findings reported here must be discussed in the context of their limitations. First, self report data have been shown to overestimate participation in preventive health screening programmes (Eaker et al. 2001). As such, electronic medical records might have been used as a more objective check on cervical screening compliance (Margot et al. 2006). Moreover, electronic medical records would allow for recruiting a more heterogeneous sample; indeed, findings reported here are based on a fairly homogenous sample of White British, well-educated women, and therefore should be interpreted with a degree of caution. However, it should be noted that findings reported here are in accord with other recent studies using more diverse samples (Amankwaha et al. 2009).

This study aimed to identify deterrents for cervical screening participation in women aged 25-35 years, a group for whom cervical cancer is most problematic (CR-UK 2010). Ethnic minority women were less likely to be screened, as were women with poor knowledge of the recommended screening interval and purpose of cervical cancer screening. These data, which highlight the importance for overcoming informational barriers, might inform the design and delivery of education based interventions with a view to improving screening compliance in this high risk group.

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**Conflict of interest**

All authors declare no conflict of interest.

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Table 2. Logistic regression on screening status.

| | Screening attendance | | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|---|---|
| | N (%)[a] | M (SD)[b] | B (SE) | Odds ratio (95% CI) | B (SE) | Odds ratio (95% CI) | B (SE) | Odds ratio (95% CI) |
| Constant | | | 0.98[†] (0.53) | | 0.57 (0.58) | | -3.59[*] (1.47) | |
| **Age** | | | | | | | | |
| 25-29 years[a] | 187 (74.21%) | - | | | | | | |
| 30-35 years | 118 (83.69%) | - | 0.38 (0.30) | 1.46 (0.81, 2.60) | 0.24 (0.31) | 1.27 (0.70, 2.31) | 0.20 (0.42) | 1.23 (0.54, 2.80) |
| **Ethnicity** | | | | | | | | |
| White[a] | 286 (80.34%) | - | | | | | | |
| Ethnic minority | 19 (51.35%) | - | -1.21[**] (0.38) | 0.30 (0.14, 0.62) | -1.15[**] (0.39) | 0.32 (0.15, 0.68) | -1.32[*] (0.59) | 0.27 (0.08, 0.85) |
| **Education** | | | | | | | | |
| Secondary school/college[a] | 29 (82.86%) | - | | | | | | |
| Undergraduate/postgraduate | 276 (77.09%) | - | -0.19 (0.50) | 0.83 (0.31, 2.21) | -0.22 (0.51) | 0.81 (0.30, 2.17) | 0.11 (0.63) | 1.12 (0.33, 3.82) |
| **Income** | | | | | | | | |
| < £20k[a] | 114 (74.03%) | - | | | | | | |
| 20k or more | 191 (79.92%) | - | 0.11 (0.27) | 1.11 (0.66, 1.87) | 0.05 (0.27) | 1.05 (0.62, 1.78) | 0.26 (0.37) | 1.29 (0.62, 2.69) |
| **Relationship status** | | | | | | | | |
| Single[a] | 104 (68.42%) | - | | | | | | |
| Partnered | 201 (83.40%) | - | 0.53[*] (0.26) | 1.71 (1.02, 2.86) | 0.70[*] (0.28) | 2.01 (1.18, 3.45) | 0.47 (0.36) | 1.60 (0.79, 3.24) |
| **Children** | | | | | | | | |
| No[a] | 234 (74.76%) | - | | | | | | |
| Yes | 71 (88.75%) | - | 0.65 (0.41) | 1.91 (0.85, 4.27) | 0.78[†] (0.42) | 2.19 (0.96, 4.99) | 0.75 (0.53) | 2.11 (0.74, 6.00) |
| **Smoker** | | | | | | | | |
| No[a] | 188 (76.73%) | - | | | | | | |
| Yes | 117 (79.05%) | - | | | -0.16 | 0.86 | -0.08 | 0.93 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | (0.28) | (0.50, 1.48) | (0.38) | (0.44, 1.94) |
| **Lifelong sexual partners** | | | | | | |
| 10 or less[a] | 219 (74.24%) | - | | | | |
| More than 10 | 86 (87.76%) | - | 1.08** | 2.96 | 1.41** | 4.10 |
| | | | (0.37) | (1.45, 6.05) | (0.49) | (1.58, 10.64) |
| **First sexual experience** | | | | | | |
| 16 years or under[a] | 127 (77.91%) | - | | | | |
| Over 16 years | 178 (77.39%) | - | 0.39 | 1.48 | 0.63 | 1.87 |
| | | | (0.28) | (0.86, 2.53) | (0.39) | (0.87, 4.04) |
| **NHS recommendation** | | | | | | |
| Every three years[a] | 214 (86.64%) | - | | | | |
| Annually | 21 (65.63%) | - | | | 0.35 (0.61) | 1.42 (0.43, 4.65) |
| 5-7 years | 61 (70.11%) | - | | | -1.07** (0.40) | 0.34 (0.16, 0.75) |
| Don't know | 9 (33.33%) | - | | | -1.82** (0.66) | 0.16 (0.05, 0.59) |
| **Test for Cancer** | | | | | | |
| No[a] | 98 (87.50%) | - | | | | |
| Yes | 207 (73.67%) | - | | | -0.99* (0.46) | 0.37 (0.15, 0.91) |
| | - | 1.58 (0.85) | | | -0.59** (0.21) | 0.55 (0.37, 0.84) |
| **Test unnecessary** | | | | | | |
| | - | 3.11 (1.21) | | | 0.27† (0.15) | 1.31 (0.97, 1.76) |
| **Fear** | | | | | | |
| | - | 2.87 (0.91) | | | -0.02 (0.22) | 0.98 (0.65, 1.50) |
| **Perceived risk** | | | | | | |
| | - | 4.23 (0.89) | | | 1.47*** (0.22) | 4.36 (2.85, 6.69) |
| **Intention** | | | | | | |
| | - | 2.83 (1.08) | | | -0.27 (0.17) | 0.77 (0.55, 1.06) |
| **Time difficulties** | | | | | | |

[a] *Data was only included for categorical variables*

[b] *Data was only included for continuous variables. Means and standard deviations differed from those presented in Table 1 because listwise deletion was used for analysis.*

† = $p < .10$, * = $p < .05$, ** = $p < .01$, and *** = $p < .001$.