



The big five and cervical screening barriers: Evidence for the influence of conscientiousness, extraversion and openness

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ABSTRACT

A female undergraduate sample ($n = 257$) was used to assess the influence of the big five personality factors on cervical screening barriers. Information on perceived barriers to the Pap test, perceived barriers to a novel screening method, HPV-DNA self-sampling, and personality (Big Five Inventory; John, Donahue, & Kentle, 1991) was collected using questionnaires. Two hierarchical multiple linear regressions assessed the influence of personality on barriers beyond the variance explained by behavioral variables including (1) past sexual intercourse experience and (2) previous Pap test participation. As hypothesized, conscientiousness was inversely predictive of Pap test barriers, and openness was inversely predictive of self-sampling barriers. Additionally, conscientiousness was also inversely predictive of self-sampling barriers, and extraversion was inversely predictive of both Pap test barriers and self-sampling barriers. Our results support the hypothesis that conscientiousness is associated with health perceptions that are conducive to positive health behaviors such as cancer screening. The relationship between openness and extraversion and lowered screening barriers provides further direction for research investigating the relationship between these personality variables and health beliefs.

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1. Introduction

1.1. Cervical screening

One of the most successful public health initiatives in the developed world has been the promotion of population-wide cervical cancer screening. A dramatic decrease in the incidence of cervical cancer followed the implementation of the Pap test, over 50 years ago (Kowalski & Brown, 1994). Despite the overwhelming success of screening initiatives, cervical cancer cases are still reported across Canada, largely due to the lack of screening (Health Canada, 2002). It remains the third most common cancer in women aged 20–49 (Fung-Kee-Fung, Animi, Howlett, & Innes, 2007) and worldwide, cervical cancer is the second leading cause of death among women (Schoell, Janicek, & Mirhashemi, 1999).

1.2. HPV-DNA testing and self-sampling

While the Pap test identifies cell changes on the cervix, a new testing method, HPV-DNA testing, has been developed to identify the presence of the human papillomavirus, the cancer-causing sexually-transmitted virus (Clifford, Smith, Munoz, & Franceschi,

2003) near the cervix. HPV-DNA self-sampling allows women to collect their own samples, and therefore has the potential to improve screening because it removes many of the barriers of the Pap test such as discomfort, pain, and embarrassment (Barata, Mai, Howlett, Gagliardi, & Stewart, 2008).

There is currently no consensus about which screening method is superior (Petignat et al., 2007), but in terms of the acceptance of self-sampling, women with a higher level of education and income have reported a preference for self-sampling over the Pap test (Dzuba et al., 2002; Stewart et al., 2007). A recent systematic review emphasized that the demographic variables associated with self-sampling acceptability are relatively well-known, but other characteristics of women who would be accepting of the screening method is an area of research that has yet to be fully explored (Stewart et al., 2007).

1.3. Personality and health behaviors

The big five personality theory – including neuroticism, extraversion, openness to experience, agreeableness and conscientiousness – offers an avenue of research to understand characteristics associated with cervical screening barriers. Among the five factors, conscientiousness, openness to experience and extraversion were of interest in particular due to the reported associations among the factors and relevant health perceptions and behaviors.

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Conscientiousness, a trait defined by characteristics such as competence, dutifulness, a strong work ethic, self-discipline and being well-organized (McCrae & Costa, 2003) has been linked to a variety of health behaviors including adherence to dialysis medical regimens (Christensen & Smith, 1995) and wellness behaviors including healthy eating and exercise (Bogg & Roberts, 2004; Booth-Kewley & Vickers, 1994). Additionally, conscientiousness is associated with physical and mental well-being (Goodwin & Friedman, 2006), and longitudinal research has indicated a strong link between conscientiousness and longevity (Friedman et al., 1995; Kern & Friedman, 2008; Martin, Friedman, & Schwartz, 2007). We note that, to the best of our knowledge, there have been no studies of conscientiousness and openness with respect to cervical screening, especially the novel self-sampling procedure.

Extraversion and openness have also been linked to health behaviors. Extraversion, a trait defined by characteristics such as being outgoing, sociable and experiencing positive emotions (McCrae & Costa, 2003) has also been positively correlated with adherence to gastric cancer screening among residents in Japan (Arai et al., 2009). Openness to experience, a personality factor defined by traits such as being imaginative, creative, curious, and having a preference for variety (McCrae & Costa, 2003) has been linked to the use of complementary and alternative medicine (Honda & Jacobson, 2005; Sirois & Gick, 2002).

1.4. The present study

The purpose of the present study was to investigate the influence of the big five personality factors on screening barriers. Perceived barriers, the psychosocial dimension of the Health Belief Model that has been described as the most important dimension in predicting health behaviors (Janz & Becker, 1984), was used as the dependent variable. Perceived barriers to the Pap test has received a great deal of attention in the literature (Glasgow, Whitlock, Valanis, & Vogt, 2000; Hennig & Knowles, 1990; Hill, Gardner, & Rassaby, 1985; Kowalski & Brown, 1994; Price, Easton, Telljohann, & Wallace, 1996; Sutton & Rutherford, 2005), and more recently, barriers to self-sampling, such as not having confidence in doing the test properly and losing the benefit of a yearly appointment with a physician, have also been reported (Barata et al., 2008; Stewart et al., 2007).

Based on the characteristics associated with conscientiousness – self discipline, dutifulness and competence – and the previously noted past research linking conscientiousness with positive health behaviors (Bogg & Roberts, 2004; Booth-Kewley & Vickers, 1994; Christensen & Smith, 1995; Friedman et al., 1995; Kern & Friedman, 2008; Roberts, Walton, & Bogg, 2005), we hypothesized that conscientiousness would be inversely predictive of perceived Pap test barriers. The Pap test is the current standard in cervical screening and therefore individuals high on conscientiousness may feel they have a duty to obtain this type of screening and would be less likely to perceive barriers to it. However, conscientiousness might be inversely related to self-sampling because conscientious individuals might wish to be more cautious and wait for more evidence with this novel procedure.

We predicted that extraversion also would be associated with lowered barriers to both types of screening based on past research mentioned earlier that indicates a relationship between extraversion and gastric cancer screening (Arai et al., 2009). Finally, we hypothesized that openness to experience would be inversely predictive of perceived self-sampling barriers, a relatively novel medical procedure, due to its characteristics of curiosity and preference for variety (McCrae & Costa, 2003), and the aforementioned association between openness and use of complementary and alternative medicine (Honda & Jacobson, 2005; Sirois & Gick, 2002).

2. Method

2.1. Participants

Two hundred and fifty-seven undergraduate female students were recruited in January and February 2009 through an online university participant pool. Participants ranged in age from 17 to 45 years ($M = 20.31$, $SD = 3.82$) and were given grade-raising credit (1%) in psychology courses for participation.

2.2. Measures

2.2.1. Big Five Inventory

The Big Five Inventory (BFI) is a 44-item scale that measures the big five personality factors using short phrases (John et al., 1991). In the present study, extraversion ($\alpha = 0.83$), agreeableness ($\alpha = 0.71$), neuroticism ($\alpha = 0.85$), and openness ($\alpha = 0.76$) and conscientiousness ($\alpha = 0.79$) all had acceptable internal reliabilities. Test–retest reliabilities and validity evidence through comparisons to other five-factor model measures have been reported for this measure (Pervin & John, 2001).

2.2.2. Screening barriers questionnaire

An original questionnaire was designed to assess Pap test barriers and self-sampling barriers. Participants responded to 11 scale items pertaining to Pap test barriers and 14 items pertaining to self-sampling barriers on 7-point Likert scales ranging from “strongly disagree” to “strongly agree”. Individual items for the questionnaire are presented in Table 1. The barriers acknowledged in the literature were used to develop the 11 items that assessed Pap test barriers (e.g., Grunfeld, 1997; Hennig & Knowles, 1990). Similarly, the additional three items on the 14-item self-sampling scale were developed based on barriers to self-sampling acknowledged in previous findings (Barata et al., 2008; Dannecker, Siebert, Thaler, Hepp, & Hillemans, 2004; Stewart et al., 2007). Pap test barriers and self-sampling barriers scores were derived by calculating the mean Likert scale response for each of the scale’s items. Both subscales have strong internal reliabilities (Pap test barriers: $\alpha = 0.89$, self-sampling barriers: $\alpha = 0.84$)¹.

2.2.3. Lifestyle and behaviors questionnaire

Due to the well-established link between cervical cancer and HPV, a sexually transmitted infection (Clifford et al., 2003), sexual experience was an important variable to consider. Information about the participant’s age, sexual behaviors and past Pap test history was collected. Variables included in the present study were (1) whether the participant had experienced sexual intercourse, and (2) whether the participant had obtained a Pap test prior to completing the study (yes/no response options).

2.3. Data analysis

Prior to conducting the main analyses, the data were screened for normality of the variables. Because a negative skew was found for the agreeableness variable, it was transformed (reflect square root) (Tabachnick & Fidell, 2007). However, because results of all analyses were similar for transformed and untransformed agreeableness variables, only results of the untransformed analyses are reported. Regression assumptions were met and no outliers or influential cases were identified.

¹ ‘Cronbach’s alpha if item was deleted’ was also calculated using SPSS 17.0. Coefficients ranged from 0.875 to 0.897 for the Pap test barriers subscale and 0.813–0.856 for the self-sampling barriers subscale indicating that all items contributed to the strong internal reliability for each subscale.

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