

RESEARCH ARTICLE

The prediction of cervical cancer screening beliefs based on big five personality traits

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Abstract

Aim: The present study was designed with the aim to predict Pap smear screening beliefs based on Big Five personality traits.

Design: The present cross-sectional study was conducted with 235 women over 18 years of age in Tehran (Iran) in 2018.

Methods: The data collection tools included the demographic information questionnaire, Pap Smear Belief Questionnaire (PSBQ) and the 10-item measure of the Big Five personality traits.

Results: People with Agreeableness personality trait were more faced with risks and Barriers and factors associated with Pap smear screening beliefs; and those with Conscientiousness personality trait were more faced with risks and Barriers. Results of the present study can help to understand how the personality affects decision-making and interactions. Therefore, consequences of counselling about screening beliefs and behavioural changes can be improved by personality-based education.

KEYWORDS

cervical cancer, nurses, nursing, personality, screening

1 | INTRODUCTION

Cervical cancer is the second most common cancer in the world (AlMubarak et al., 2019), and it is estimated as fourth leading cause of cancer death in women of the world (Bray et al., 2018). It is more common in developing countries, and the World Health Organization (WHO) has reported that 80% of deaths from this cancer occur in low-income and developing countries (Rani, Singh, & Thapa, 2015). In Iran, the death rate from cervical cancer is about 44% (Jemal, Center, DeSantis, & Ward, 2010).

Most cases of cervical cancer deaths in developing countries may be due to inadequate cancer prevention and control programmes (Shrestha, Neupane, Vedsted, & Kallestrup, 2018), whereas, despite

the fact that the cervical cancer usually has no symptoms at early stages, it can be easily diagnosed. The cervix malignancy screening by Pap smear is an effective method for early diagnosis of cervical cancer (Ashtarian, Mirzabeigi, Mahmoodi, & Khezeli, 2017; Bora, Chowdhury, Mahanta, Kundu, & Das, 2017), so that the reduction of incidence and mortality of cervical cancer in developed countries has been attributed to Pap smear screening (Burton-Jeangros et al., 2017). Pap smear is a method with a sensitivity of about 50%–75% and a 98%–99% of specificity (Farzaneh, Heydari, Shekarchi, & Kamran, 2017) and is easy to do and low cost (Shaki, Chakrabarty, & Nagaraja, 2018). Nevertheless, a large number of women do not perform Pap smear (Ashtarian et al., 2017; Maj et al., 2019; Watson, Benard, & Flagg, 2018). The results of some studies in Iran have

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reported low Pap smear rates (Babazadeh et al., 2019; Farzaneh et al., 2017).

Studies have suggested different reasons for women's unwillingness to do Pap smear including the lack of knowledge, false beliefs, fear of cancer diagnosis, fear of pain, embarrassment and social stigma (Ashtarian et al., 2017; Julinawati, Cawley, Domegan, Brenner, & Rowan, 2013; Lim & Ojo, 2017). Behavioural shaping is directly or indirectly influenced by moderating factors including demographic variables, individual awareness and personality traits (Deng, Lin, Liu, Chen, & Li, 2017). Personality traits are factors that affect the health behaviour. In fact, personality traits are the bases of behavioural characteristics. Personality consists of five factors, namely Neuroticism, (sociality), in the acceptance of experience (creative behaviour, curiosity, pragmatism), conscientiousness and treatment Agreeableness (Hill & Gick, 2011).

Results of a research indicated that women with healthy or inflammatory Pap smear results had higher scores of Neuroticism and psychoticism and lower scores of and Lie than women with HPV and CIN Pap smear results. Therefore, there was a consistency between physiological and personality traits (Kreitler, Levavi, & Bornstein, 1996).

Referring to cervical cancer screening centres can be also affected by personality dimensions as a health behaviour. The diagnosis of aspects of personality is very important as a barrier or facilitator in an attempt to do a Pap smear because carers and patients can affect this behaviour with knowledge about them.

Given the high mortality rate of cervical cancer in developing countries, personality traits may affect the unhealthy lifestyle and due to the spread of Risk factors for diseases and cancers and the lack of comprehensive and specialized studies on personality traits and their effects on cancer-preventing beliefs and behaviour, the present study aimed to predict Pap smear screening beliefs based on Big Five personality traits.

2 | METHOD

The present cross-sectional study was conducted in Tehran (Iran) in 2018. In this cross-sectional study, 235 women over the age of 18 years participated in the study. Sample size was obtained equal to 195 after a preliminary study on 10 women using the correlation coefficient ($r = .20$), and the final sample size was 235 considering 20% of increase in size resulting from random sampling. The inclusion criteria were women with a history of sexual activity and 18 years of age and satisfaction with participation in the study; and the exclusion criteria included women with a history of cervical cancer.

After receiving a letter from Shahid Beheshti University of Medical Sciences and obtaining permission from the relevant health centres, the research units were selected if they had inclusion criteria after explaining the subject of the study. Data were collected by two midwifery specialists as questioners after obtaining the code of ethics from the Research Deputy of Shahid Beheshti University of Medical Sciences.

Multistage sampling was performed. At first, North, South, Central, East, and Shemiranat districts of Tehran which include clinics covered by Shahid Beheshti University were considered as 5 floors. Then, at each site, one centre was randomly selected and in each centre, sampling method was available (47 participants per centre). Written consent was obtained from 235 eligible women to participate in the study, assuring women that information about their participants would remain confidential, and their right to withdraw from participation at any stage. In the present study, we did not have miss data.

The data collection tools were as follows:

1. *Demographic information* (age, occupation, education level, marital status and number of children in the case of marriage).
2. *Pap Smear Belief Questionnaire (PSBQ)*: This scale has 28 questions and four factors (Benefit, Vulnerability, Risks and Barriers), which are scored on a 5-point Likert scale ranging from strongly disagree = 1 to strongly agree = 5.

The Cervical Cancer Screening Beliefs Questionnaire was first designed by Ackerson and Doane (2017) in English as was called the PSBQ with 28 questions. Saei Ghare Naz et al. (2018) examined the validity and reliability of PSBQ in Iran. This questionnaire has acceptable validity and reliability and had a good internal consistency with a 46% variance (0.84). The questionnaire was valid and reliable in Iran after the removal of four questions during the validation process. Cronbach's alpha was obtained as .93, and the obtained correlation coefficient was .98. The 24-item version was used in the study. PSBQ was used to measure Pap smear screening beliefs.

3. *Big five personality trait questionnaire*: This scale has 10 questions that are scored on a 5-point Likert scale ranging from totally disagree = 1 to totally agree = 5 (questions 1, 3, 4, 5 and 7 are scored in inverse). From total scores, one general score is obtained from the personality; and if this score is higher, it indicates the higher personality originality. Mohammad Zadeh and Najafi (2010) examined the validity and reliability of 10-item five personality traits questionnaire in Iran. The results indicated the factor validity and consistency with prior research; and the obtained test-retest coefficient was 0.84 within 4 weeks. Big five personality trait questionnaire was used to measure personality. In the present study, SPSS version 22.0 (SPSS Inc., Chicago, IL) was used to analyse data; and descriptive statistical, t and regression tests were used to determine predictors. The significance level of study was considered to be 0.05.

3 | RESULT

Findings of the present study, which was conducted on 235 women, indicated that the mean + standard deviation of age were 36.36 (SD 11.33) and 40.72 (SD 12.02) years in studied women and their spouses, respectively. The mean \pm standard deviation of total life

span was 21.13 ± 4.68 . About 24% of women were employed. Table 1 presents other demographic characteristics of studied women.

Table 2 presents the correlation between women's health beliefs about Pap smear screening and its dimensions with Big Five personality traits. Among dimensions of Pap smear screening belief, Benefit had a direct and significant correlation with Conscientiousness ($p = .031$, $r = .140$), but an inverse significant correlation with Openness ($p = .022$, $r = -.150$). The Vulnerability had an inverse significant correlation with Agreeableness ($p = .002$, $r = -.20$), but a direct and significant correlation with Neuroticism ($p = .003$, $r = .192$). The Risk had a direct and significant correlation with Extraversion ($p = .039$, $r = .135$) and Agreeableness ($p = .002$, $r = .201$), but an inverse significant correlation with Neuroticism ($p = .013$, $r = -.161$). The Exam had a direct and significant correlation with Extraversion ($p = .026$, $r = .146$) and Agreeableness ($p = .0001$, $r = .284$), but an inverse significant correlation with Neuroticism ($p = .004$, $r = -.187$).

Agreeableness predicts the Risk and Exam, so that one unit increase in the Agreeableness leads to 0.353 of standard deviation of increase in Risk. Furthermore, one unit increase in the Agreeableness

leads to 1.12 times of increase in Exam. Conscientiousness forecasts Exam, so that one unit increase in the Conscientiousness leads to 0.891 of standard deviation of increase in Exam (Table 3).

4 | DISCUSSION

The present study was conducted on 235 individuals; and its results indicated that among dimensions of Pap smear screening belief, there was significant direct correlation between Benefit and Conscientiousness; Vulnerability and Neuroticism; Risk with Extraversion and Agreeableness; and Exam with Extraversion and Agreeableness, but there was significant inverse correlation between Benefit and Openness; Vulnerability and Agreeableness; Risk and Neuroticism; and Exam with the Neuroticism. Moreover, the Agreeableness predicted Risk and Exam; and Conscientiousness predicted Exam.

Results of the present study indicated that Agreeableness was a strong predictor of factors associated with cervical cancer screening and performing Pap smear; and the more personality is more agreeable, the more the understanding of Barriers and risks increases. As some evidence suggests that personality traits are closely related to the health status and the incidence of some diseases (Weston, Hill, & Jackson, 2015). In Health and Retirement study with 14,394 participants (men and women), the results showed that higher Conscientiousness and were associated with a higher likelihood of cervical, breast and prostate screening performance (Aschwanden et al., 2019). Cohort study results by GAZEL indicated that personality traits could play decisive roles in women's participation in breast cancer screening (Lemogne et al., 2018). However, people with Agreeableness personality trait react to positive and negative effects of events on behaviour, attitude, thoughts and interactions with self-esteem and motivation and self-assess through positive perception of themselves and conditions (Janasz, 1997). In fact, individuals with Agreeableness personality trait assess risks and Barriers of non-implementation of Pap smear screening on their health and accordingly decide to do the Pap smear screening.

Furthermore, results of the present study indicated that the Conscientiousness was another important predictor of factors associated with cervical cancer screening and doing Pap smear. Results of a review study by Kern and Friedman (2008) supported the importance and role of Conscientiousness trait on the health throughout life. According to results of a meta-analysis, the Conscientiousness dealt with individual differences in the tendency to follow social norms and laws (John & Srivastava, 1999). Bogg and Brent's meta-analysis study showed that Conscientiousness traits related to the health-related behaviours (Bogg & Roberts, 2004).

A study by Hill and Gick (2011) indicated that the health perception and behaviour such as cancer screening were correlated with the responsibility (Conscientiousness). Results of a research with men with the aim of determining relationships of personality factors and prostate screening indicated that prostate cancer screening was directly correlated with the Conscientiousness, but had an

TABLE 1 Demographic characteristics of studied women

Variables	% (N)
Marital status	
Married	88.51 (208)
Single	11.49 (27)
Total	100 (235)
Lactation history	
Yes	80 (188)
No	20 (47)
Total	100 (235)
Delivery status	
Vaginal	41.20 (103)
Caesarean section	36.40 (91)
Both	4 (10)
None	18.40 (46)
Total	100 (235)
Race	
Persian	42.98 (101)
Non-Persian	57.02 (134)
Total	100 (235)
Education	
Illiterate	8.08 (19)
Elementary and secondary school	23.40 (55)
Diploma	29.78 (70)
Academic	38.72 (91)
Total	100 (235)
Employment	
Yes	24.68 (58)
No	75.31 (177)
Total	100 (235)

TABLE 2 The correlation between Pap smear screening beliefs with Big Five personality traits

	Extraversion		Agreeableness		Conscientiousness		Neuroticism		Openness	
	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r
Benefit	.092	-.110	.633	.031	.031	.140	.377	.058	.022	-.150
Vulnerability	.611	-.033	.002	-.20	.935	-.005	.003	.192	.848	.013
Risk	.039	.135	.002	.201	.887	-.009	.013	-.161	.725	.023
Exam	.026	.146	.000	.284	.054	.126	.004	-.187	.615	-.033
Total Pap	.755	.020	.290	.069	.339	.063	.986	-.001	.399	-.055

TABLE 3 Summary results of the simultaneous regression between Pap smear screening beliefs and Big Five personality traits

	B	Std. Error	Beta	p-value
Extraversion				
Benefit	-0.046	0.184	-0.021	.805
Vulnerability	-0.080	0.145	-0.048	.583
Risk	0.282	0.238	0.101	.238
Exam	0.873	0.571	0.126	.127
Total	1.046	0.768	0.113	.174
Agreeableness				
Benefit	0.195	0.123	0.120	.114
Vulnerability	0.035	0.097	0.027	.718
Risk	0.353	0.159	0.165	.027
Exam	1.121	0.383	0.211	.004
Total	1.687	0.515	0.238	.001
Conscientiousness				
Benefit	-0.053	0.141	-0.025	.709
Vulnerability	-0.112	0.111	-0.067	.313
Risk	0.160	0.182	0.057	.380
Exam	0.891	0.436	0.128	.042
Total	0.875	0.586	0.094	.137
Neuroticism				
Benefit	0.093	0.114	0.058	.416
Vulnerability	0.092	0.090	0.073	.307
Risk	0.000	0.148	0.000	.999
Exam	-0.588	0.354	-0.112	.098
Total	-0.407	0.476	-0.058	.393
Openness				
Benefit	-0.092	0.175	-0.043	.60
Vulnerability	0.077	0.138	0.046	.578
Risk	-0.229	0.226	-0.082	.313
Exam	-0.657	0.541	-0.094	.226
Total	-0.897	0.728	-0.096	.219

inverse relationship with the Neuroticism (Neeme, Aavik, Aavik, & Punab, 2015). Results of another study indicated that colorectal cancer screening was correlated with Conscientiousness (Gale, Deary, Wardle, Zaninotto, & Batty, 2015). Results of a research by Kreitler and Bornstein indicated that women with healthy or

inflammatory Pap smear results had higher scores of Neuroticism and psychoticism and lower scores of and Lie than women with HPV and CIN Pap smear results. Therefore, there was a consistency between physiological and personality traits (Kreitler et al., 1996). Results of a study by Friedman, Hemler, Rossetti, Clemow, and Ferrante (2012) indicated that personality traits such as Conscientiousness and self-regulatory were effective factors in doing difficult and scary tasks by women. Personality traits are important and effective factors in doing most health behaviour. Foresti et al. (1982) stated that hormonal changes were affected by personality traits of each woman, as women experienced all their life experiences based on personality traits; hence, some of their personality traits led to better interpretation of conflicts and fluctuations.

However, the Conscientiousness trait has a positive correlation with the perceived ability, perceived responsibility for controlling assignments, positive excitement, sympathy, happiness, hope and pride (Penley & Tomaka, 2002). Conscientious individuals are self-regulating and progressing and accomplish the treatment advice (Skinner, Hampson, & Fife-Schaw, 2002). In fact, people with Conscientiousness trait control and regulate underlying factors associated with the Pap smear screening and decide to perform Pap smear screening on this basis.

Our results suggest that the midwives and gynaecologists should be aware about the role of personality of women of cervical cancer screening performance, as the personality had a key role in health behaviour and health outcomes (Nolan, McCrory, & Moore, 2019). The healthcare providers should be paid more attention to women with different personality traits to improve the cervical cancer screening adherence.

A limitation of the present research was its implementation by self-report questionnaires as the participants might give unreal or distorted answers in this type of research. It is suggested to conduct further studies due to limitations of similar studies in this regard. The personality dimensions associated with cervical cancer screening beliefs were identified in a selected population of Iranian women, and it was a strength of research; hence, it is suggested that attention be paid to the importance of these personality dimensions in national cervical cancer screening programmes. Furthermore, healthcare providers should consider personality dimensions in the implementation of interventions that promote women's health and prevent the incidence of cancer.

5 | CONCLUSION

People with Agreeableness personality trait were more faced with risks and Barriers and factors associated with Pap smear screening beliefs; and those with Conscientiousness personality trait were more faced with risks and Barriers. Results of the present study can help to understand how the personality affects decision-making and interactions. Therefore, consequences of counselling about screening beliefs and behavioural changes can be improved by personality-based education.

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CONFLICT OF INTEREST

The authors have no conflicts of interest relevant to this article.

AUTHORS' CONTRIBUTION

All authors made a substantial contribution to writing of the paper draft and met the four criteria for authorship recommended by the International Committee of Medical Journal Editors.

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