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## Lifestyle and health-related predictors of cervical cancer screening attendance in a Swiss population-based study



Aline Richard<sup>a,\*</sup>, Sabine Rohrmann<sup>a</sup>, Seraina M. Schmid<sup>b,c</sup>, Brigitte Frey Tirri<sup>d</sup>, Dorothy J. Huang<sup>e</sup>, Uwe Güth<sup>f,g</sup>, Monika Eichholzer<sup>a</sup>

<sup>a</sup> University of Zurich, Epidemiology, Biostatistics and Prevention Institute, Division of Chronic Disease Epidemiology, Hirschengraben 84, CH-8001 Zurich, Switzerland

<sup>b</sup> Spital Grabs, Department of Gynecology & Obstetrics, Spitalstrasse 44, CH-9472 Grabs, Switzerland

<sup>c</sup> Breast Center St. Gallen, Rorschacher Strasse 150, CH-9006 St.Gallen, Switzerland

<sup>d</sup> Cantonal Hospital Baselland, Department of Gynecology & Obstetrics, Rheinstrasse 26, CH-4410 Liestal, Switzerland

<sup>e</sup> University Hospital Basel, Department of Gynecology and Obstetrics, Spitalstrasse 21, CH-4031 Basel, Switzerland

<sup>f</sup> Cantonal Hospital Winterthur, Department of Gynecology and Obstetrics, Brauerstrasse 15, CH-8401 Winterthur, Switzerland

<sup>g</sup> Breast Center "Senosuisse", Brauerstrasse 15, CH-8401 Winterthur, Switzerland

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#### ABSTRACT

*Background:* Since the implementation of cervical cancer (CC) screening, incidence and mortality rates have decreased worldwide. Little is known about lifestyle and health-related predictors of cervical cancer screening attendance in Switzerland. Our aim was to examine the relationship between lifestyle and health-related factors and the attendance to CC screening in Switzerland.

*Methods:* We analyzed data of 20–69 years old women (n = 7319) of the Swiss Health Survey (SHS) 2012. Lifestyle factors included body mass index, smoking status, alcohol consumption, physical activity and attention to diet. Health-related factors of interest were diabetes, hypertension, high cholesterol levels, chronic diseases, self-perceived health, and psychological distress.

We performed multivariable logistic regression analyses with the dichotomized CC screening status as outcome measure and adjusted for demographic factors.

*Results*: Obesity, low physical activity, and not paying attention to diet were statistically significantly associated with lower CC screening participation. High cholesterol levels and history of chronic diseases were statistically significantly positively associated with screening participation.

*Conclusion:* Being obese, physically inactive and non-attention to diet are risk factors for CC screening attendance. These findings are of importance for improving the CC screening practices of low-user groups.

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### 1. Introduction

Cervical cancer (CC) is the second most common cancer in women worldwide, although incidence and mortality have decreased markedly [25,49], following the introduction of the Papanicolaou (PAP) test for cervical cancer. It is estimated that CC screening reduces cervical cancer incidence by approximately 80% [6,32]. In Switzerland, which provides a broad, opportunistic screening system, CC screening has been promoted since the late 1960s. This resulted in a reduced CC incidence, from 440 new cases in 1980 to 210 cases in 2007 [49]. Recommendations of the Swiss Federal law of health insurance for CC screening in Switzerland include one Pap smear every three years after two annual negative results from the age of 18 until 69 years [4]. In general, women are invited by their gynecologist for the examination. The CC screening time interval depends on the doctor's personal judgment. For CC screening there is no organized program in Switzerland.

So far, it has been shown convincingly that demographic factors are of importance in relation to CC screening attendance. Accordingly, a systematic review found a positive association of educational level and financial status with CC screening attendance [39]. Furthermore, being married was associated with higher attendance in different ethnicities. In contrast, age appears to be inversely associated to CC screening. Another review observed a lower participation rate in screening in older,



<sup>\*</sup> Corresponding author.

*E-mail addresses*: aline.richard@uzh.ch (A. Richard), Sabine.rohrmann@uzh.ch (S. Rohrmann), Seraina.Schmid@srrws.ch (S.M. Schmid), Brigitte.FreyTirri@ksbl.ch (B.F. Tirri), Dorothy.Huang@usb.ch (D.J. Huang), uwe.Gueth@usb.ch (U. Güth).

uninsured, homeless and migrant women with language barriers, in women who have sex with women, and in obese women [10]. According to the 2007 Swiss Health Survey, women with Swiss nationality and high educational level adhered more often to CC screening than non-Swiss women and women with only compulsory education [52].

Only few studies examined the associations of lifestyle and health factors with CC screening attendance. Nelson et al. reported that smokers, obese women and women with psychological distress participated less often in CC screening [51]. Obesity was shown to be a predictor of lower CC screening attendance in a variety of studies; nonetheless, opposite or null results between obesity and screening participation were observed in some other studies [3,19]. A systematic review came to the conclusion that perceived screening facilities-related barriers and perceived psychological barriers to CC screening were associated with lower screening participation [12].

Chronic diseases, such as diabetes or hypertension were negatively associated with CC screening attendance [33,40,58] in some but not all studies [42]. Regarding associations between mental health and CC screening attendance, a lower screening participation among women with mental health problems such as depression or psychological distress was observed [43,64].

Table 1

Baseline characteristics (demographic, lifestyle and health related factors) of 18-69 years old women of the 2012 Swiss Health Survey.<sup>a</sup>

		Total
Women, n		7319
Age, mean		43.9
		%
Cervical cancer screening	Never	17.8
	Within the last 3 years	72.9
	More than 3 years ago	9.3
Demographic factors		
Age (years)	≥20 to <30	19.5
	$\ge$ 30 to <40	20.3
	$\ge$ 40 to <50	25.7
	$\ge 50$ to <60	18.9
		15.5
Region of Switzerland	German region	68.7
	French region	26.2
	Italian region	5.1
Area of residence	Urban	73.1
	Rural	26.9
Nationality	Swiss	77.5
	Non-Swiss	22.5
Educational level	High	27.2
	Middle	61.2
	Low	11.6
Marital status	married / registered partnership	54.3
	Single, divorced / dissolved partnership, separated, widowed	45.7
Lifestule factors		
Lifestyle factors	Underweight (DML $\cdot$ 10 $\Gamma$ $\ln(m^2)$ )	5.9
BMI Smoking status	Underweight (BMI < 18.5 kg/m <sup>2</sup> )	
	Normal weight (BMI $\ge$ 18.5 to 24.9 kg/m <sup>2</sup> )	65.0
	Overweight (BMI $\ge$ 25 to 29.9 kg/m <sup>2</sup> )	20.8
	Obesity (BMI $\ge$ 30 kg/m <sup>2</sup> )	8.3
	Never smokers	52.5
	Ex-smoker	20.2
	Current smokers	27.3
Alcohol $\geq$ 20 g/day	No	96.2
	Yes	3.8
Physical activity	$\geq$ 150 min per week	71.0
	<150 min per week	29.0
Attention to diet	Yes	76.3
	No	23.7
Health-related factors		
Diabetes	No	97.4
	Yes	2.6
Hypertension	No	81.2
	Yes	18.8
High cholesterol	No	87.1
-	Yes	12.9
Chronic diseases <sup>b</sup>	No	69.1
	Yes	30.9
Self-perceived health	Good, very good	85.3
	Fair, poor, very poor	14.7
Psychological distress	Low	78.6
rsychological distress	Moderate	15.1
	High	6.3
	ingn	0.3

<sup>a</sup> All proportions are weighted, except n.

<sup>b</sup> Ongoing diseases or health problem lasting for at least 6 months or expected to last further 6 months.

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