

ORIGINAL ARTICLE

Cervical cancer and screening: knowledge, awareness and attitudes of women in Malta

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Keywords

Cervical cancer • Cervical screening • Knowledge • Attitudes

Summary

Objectives. *This study comes at an opportune time due to recent introduction of the National Cervical Cancer Screening programme in Malta. It aims to assess the knowledge of 25-64 year-old females on cervical cancer and attitudes towards screening.*

Study design. *A cross-sectional, telephone-based, quantitative survey conducted in 2017.*

Methods. *The survey tool was based on the Cervical Cancer Awareness Measure questionnaire and was carried out among a random stratified sample of females of 25-64 years, resident in Malta. Multivariate logistic regression models were applied.*

Results. *407 females (85% response rate) were interviewed. Knowledge of cervical cancer risk factors and symptoms was*

found to be significantly higher in women with a higher level of education ($p < 0.001$). Cervical screening was attended every 3 years by 69% of respondents. Regular attendees were more likely to have children ($p = 0.001$), have experienced cancer in a close family member ($p = 0.002$), and were between 35-44 and 45-54 years old ($p < 0.001$). The main reasons for non-attendance were embarrassment, fear of the test and fear of the result.

Conclusion. *This research provides a better understanding of who are the vulnerable groups with respect to cervical cancer knowledge and screening attendance. Improving health literacy and implementing health promotion campaigns will improve early symptom recognition, risk factor knowledge and attendance for screening.*

Introduction

Cervical cancer (CC) is an important public health challenge. It is the fourth and sixth most prevalent cancer in females, worldwide and in Europe, respectively [1]. This cancer is most common in women between 35-45 years [2, 3], a period of time where women are most active and productive. Therefore, it leads to significant psychological, social and economic strain on the affected individual, their family and the community [4].

CC can be avoided through primary prevention which is the Human Papillomavirus (HPV) vaccination and by engaging in secondary prevention by attending for cervical screening (CS) [5]. There are disproportionate variations in the incidence and survival rates of CC, with women of lower socioeconomic status (SES), those from ethnic minority groups and those living in developing countries being affected more than others [3, 5]. Providing education and awareness of CC risk factors, symptoms and preventive services availability, reduces this inequality gap since CC can be detected earlier [5]. The European Union (2015) recommends that screening is offered through a population-based, organised programme which should start between 20-30 years and is to continue up to 60-65 years, at 3-5 year intervals [5]. Currently, there are 22 Member States implementing, piloting or planning for a population-based CS programme [6]. Moreover, the HPV vaccination should also be delivered through a population-based organised

programme which targets females before they become sexually active [5].

CC incidence and mortality rates have remained relatively stable over the past 20 years in Malta with local rates being lower than the rates of Europe and the European Union [7, 8]. However, the 5-year relative survival rate of CC cases (2000-2007) for Malta was 54.73%, which ranks Malta as having the second worst 5-year survival rate in the 29 represented European countries [9]. However, results should be interpreted with caution as the confidence interval for Malta is wide due to small numbers of CC cases and deaths.

Locally the importance of increasing the knowledge of cancer symptoms and risk factors, and tackling any possible negative views on cancer screening was emphasised in the National Cancer Plan for the Maltese Islands 2017-2021 (NCP) [10]. The national CS programme was launched in 2016, prior to this, females in Malta attended for opportunistic screening both in the public and the private sector. The current organised programme is targeting women aged 27 to 39 years and is conducted via Liquid-based cytology and if results are abnormal and the woman is above 30 years of age, the HPV test is conducted as well. The participation rate for 2019 was 25% for the organised screening programme, however many attend for opportunistic screening. In the European Health Interview Survey 2014/2015, 82.3% of females between 27 and 37 years answered that they attended for CS in the public or private sector within the 3 years prior to the survey [11]. Females of 40-64 years

are still being screened through opportunistic screening. An HPV vaccination programme was introduced in 2012 and provides the vaccine for 12-year-old girls. Through this study the researchers wanted to assess the level of knowledge of cervical cancer symptoms and risk factors amongst the Maltese female population and their awareness of preventative services available at the National Health Systems. This study also aimed at obtaining a comprehensive picture on the attitudes towards cervical screening and on barriers identified by females who are not getting screened.

Methods

STUDY POPULATION

The target population was females of 25 to 64 years residing in Malta during the previous year. A random, representative sample of 800 females stratified by 10-year age groups and the 6 regions of Malta was taken from the Maltese Identity Card Register. Considering a 95% confidence level, the sample needed to have an accuracy of at least $\pm 5\%$, would be of at least 384 respondents. When accounting for a 20% loss of participants due to inability to find their contact number and an approximate response rate of 60% for telephone interviews, the size of the sample needed was inflated up to 800 females. The Identity Card register was used as the reference population for Malta.

Females, who did not have a registered contact number in the National Screening Unit database or in the online directory, had hearing or cognitive problems or were abroad during the fieldwork, were excluded.

DEVELOPMENT OF RESEARCH TOOL

The Cervical Cancer Awareness Measure questionnaire developed by the University College London, Health Behaviour Research Centre, was culturally adapted to Malta and used as the basis of the research tool [12]. The Cervical Cancer Awareness Measure covers questions regarding awareness of the symptoms and risk factors of CC, the public knowledge on National Cervical Screening and HPV vaccination programme, and demographic information. Questions on uptake of CS and any possible barriers were taken from another two studies and added to the research tool [13, 14] after relevant permissions were sought and obtained. Psychometric evaluation of the tool was then conducted. The tool was tested for validity, reliability and then piloted on 50 females, to produce the final research tool which was used during the fieldwork.

DATA COLLECTION AND ANALYSIS

Data was collected in 2017 using a telephone-based interview. Informed consent was given by the participant over the phone prior to the interview. The participants' anonymised answers were then inputted into a spreadsheet. The socio-demographic variables were grouped before data analysis: 1) age was categorised in 10-year

age groups; 2) locality of residence was categorised to the 6 regions of Malta; 3) the level of education was grouped in International Standard Classification of Education (ISCED) levels 0-2, 3-4, 5-8; 4) employment was split in "Gainfully employed" and "Not gainfully employed"; 5) the last time the smear test was done was grouped in "Smear test done less than 3 years ago", "Smear test done more than 3 years ago" and "Smear test was never done".

A score was formulated for the CC symptom knowledge and the CC risk factor knowledge. For the symptom knowledge questions, respondents were given 1 mark for every "Yes" and 0 marks for every "No" and "Don't Know" they answered. For the risk factor knowledge question respondents were given 1 mark for "Agree" and "Strongly Agree" and 0 marks for "Strongly Disagree", "Disagree" and "Don't Know" answers given [15].

The data was analysed using Statistical Package for Social Sciences (SPSS) version 20. Univariate analysis using Chi-squared test, Fisher's Exact Test and Analysis of Variance (ANOVA) was undertaken to assess the association between the identified dependent and independent variables. The independent variables which were significantly associated with the dependent variables were used to create models using multivariate logistic regression technique for the following dependent variables:

- Model 1: unprompted identification of any cervical cancer risk factors;
- Model 2: awareness of an organised cervical screening programme at the National Screening Unit;
- Model 3: awareness of the HPV Vaccination programme on the National Immunisation Schedule;
- Model 4: when was the last smear test done (less than 3 years, more than 3 years, never).

Results

RESPONSE RATE

From the original sample there were 474 subjects who met the inclusion and exclusion criteria. A response rate of 85.86% was obtained (407 respondents). There was no statistically significant difference between the age and region characteristics of the responders, the non-responders, the non-eligible females and the Identity card register population and therefore the study sample population was considered to be representative of the target population for the variables compared.

SOCIO-DEMOGRAPHIC CHARACTERISTICS

The socio-demographic characteristics of the 407 females who participated in this study are summarised in Table I. The mean age of the participants was 42.49 ± 11.85 years (range: 25-64 years).

SYMPTOMS AND RISK FACTORS KNOWLEDGE

74.94% ($n = 305$) of the participants were able to identify more than 3 symptoms when prompted, with the most identified symptoms being post-menopausal bleeding, persistent pelvic pain and weight loss (Fig. 1). The

Tab. I. Participants socio-demographic features.

Variable	Category	Frequency (n = 407)	Percentage (%)
Age group	25-34	122	29.98
	35-44	106	26.04
	45-54	88	21.62
	55-64	91	22.36
Country of birth	Malta	375	92.14
	EU country	9	2.21
	Non-EU country	23	5.65
Region	Gozo and Comino	33	8.11
	Northern	72	17.69
	Northern Harbour	137	33.66
	South Eastern	56	13.76
	Southern Harbour	61	14.99
	Western	48	11.79
Civil status	Single	104	25.55
	Married/ registered relationship	266	65.36
	Separated	26	6.39
	Widowed	4	0.98
	Divorced	3	0.74
	Refusal	4	0.98
Have children	No	122	29.98
	Yes	285	70.02
ISCED level	0-2	186	45.70
	3-4	74	18.18
	5-8	147	36.12
Employment	Gainfully employed	281	69.04
	Not gainfully employed	126	30.86

Fig. 1. Correctly identified cervical cancer symptoms.

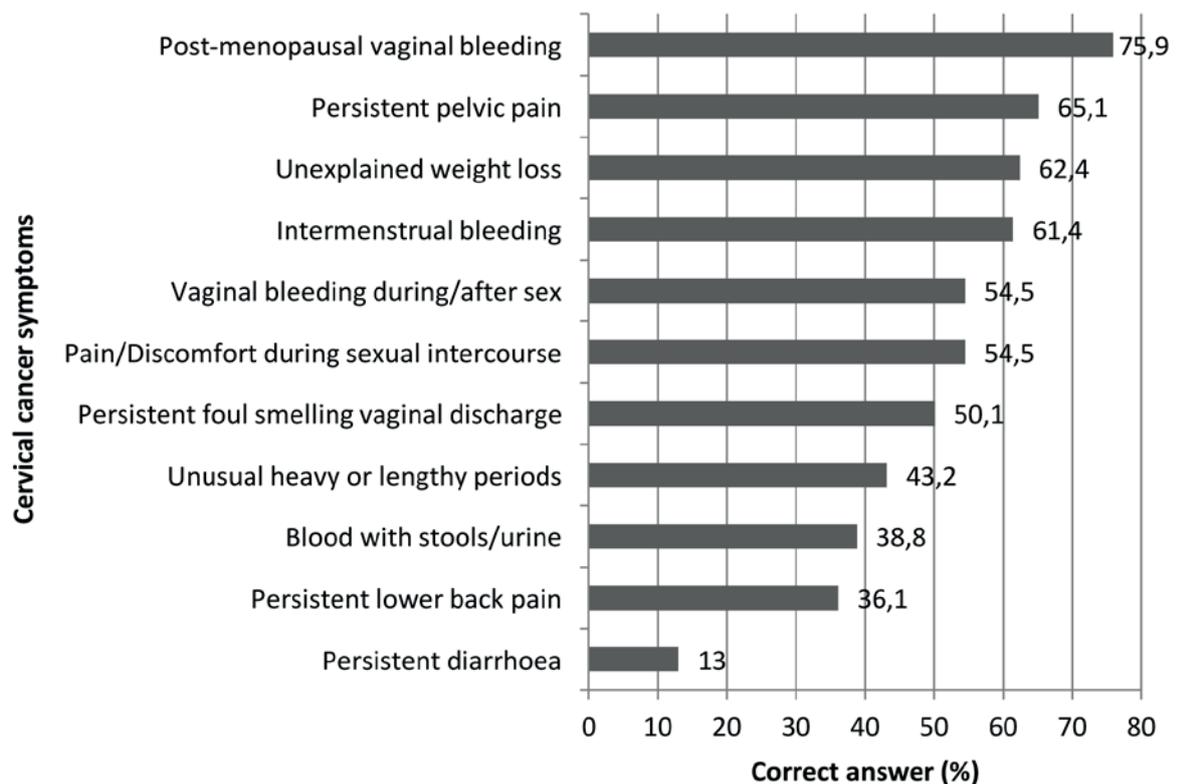
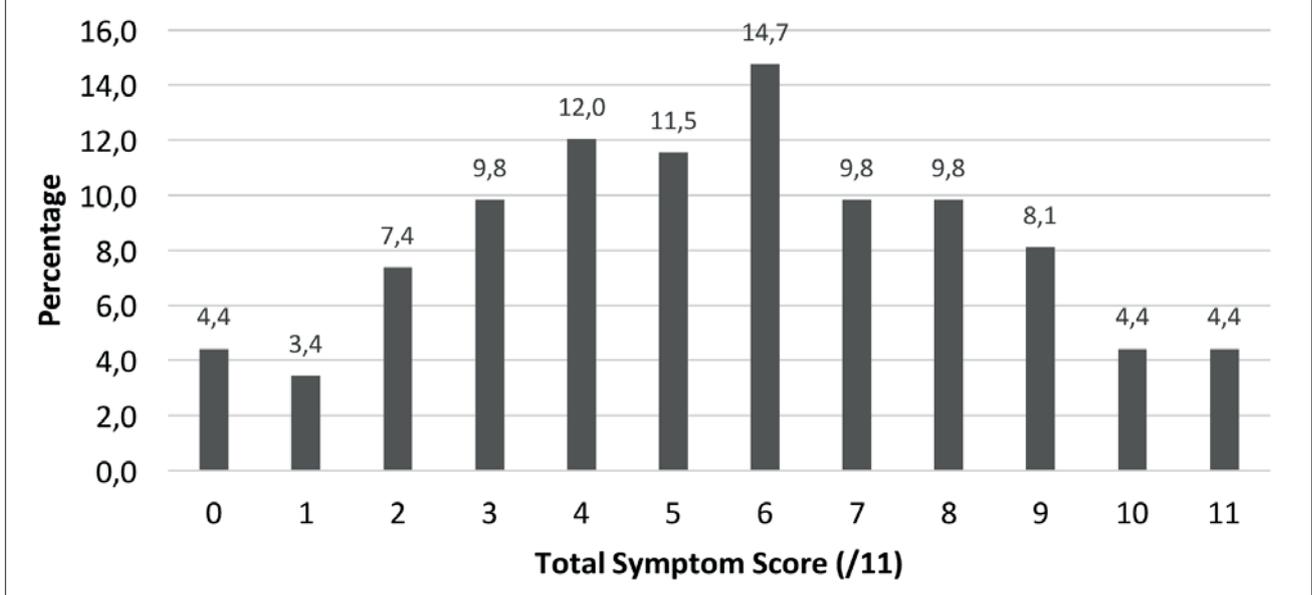


Fig. 2. Total score for the number of symptoms positively identified.



mean total symptom score attained was 5.55 ± 2.82 (range: 0-11) out of maximum score of 11 (Fig. 2). Participants were also asked to identify any CC risk factors unprompted. 46.44% (n = 189) were unable to identify any risk factors, while only 10.32% (n = 42) of participants were able to correctly identify the two most important factors which are multiple sexual partners and HPV infection. Only 38.1% (n = 155) of the research population knew that HPV infection is a risk factor (prompted). The mean total risk factor score was 4.71 ± 2.70 (range: 0-10) out of a maximum score of 10. Women with a higher level of education were significantly more likely to be aware of risk factors (Mean Difference between ISCED level 0-2 and ISCED level 5-8: -0.72, 95% CI = -1.43, -0.01; p = 0.040) and symptoms associated with cervical cancer (Mean Difference between ISCED level 0-2 and ISCED level 5-8: -1.27, 95% CI = -2.00, -0.53; p < 0.001). For the unprompted identification of risk factors, none of the participants who were between 55 and 64 years were able to identify two or more risk factors. Unemployed women (OR = 0.27, 95% CI = 0.10-0.71; p = 0.014) and women with a low level of education (OR = 0.24, 95% CI = 0.11-0.52; p < 0.001) were significantly less likely to be aware of any risk factors while females who had a past diagnosis of HPV infection were more likely to mention 2 risk factors unprompted (OR = 3.89, 95% CI = 1.29-11.69; p = 0.036).

KNOWLEDGE ON AVAILABLE PREVENTATIVE SERVICES

When asked about the National CS Programme, 50.86% (n = 207) of the participants were aware of its existence but only 38.46% (n = 80) of these, identified the correct age cohort which is currently being invited. Awareness was significantly higher amongst females who were from the youngest age groups (p < 0.001), 25-34 years (OR = 2.71, 95% CI = 1.55-4.75) and 35-44 years

(OR = 2.68, 95% CI = 1.50-4.77). Women with a high level of education, ISCED level 5-8 (OR = 1.94) were significantly more (p = 0.044) aware of the National CS Programme when compared to ISCED level 0-2 (OR = 0.72, 95% CI = 0.47-1.11). On the other hand women who are unemployed (OR = 0.472, 95% CI = 0.307-0.72; p = 0.010), have children (OR = 0.54, 95% CI = 0.35-0.83; p = 0.011) and were married in the past (OR = 0.66, 95% CI = 0.418-0.99; p = 0.029) were significantly less aware of the National CS Programme.

Regarding the HPV vaccination programme, 56.27% (n = 229) of participants were aware of this service with nearly half of these (n = 111) knowing the correct age when the vaccine is given. Awareness of this service was significantly higher within the two youngest age groups (p < 0.001). The OR of the 45-54 years age group (OR = 0.74, 95% CI = 0.41-1.34) falls outside the ORs and CIs of the 25-34 years (OR = 1.67, 95% CI = 0.96-2.91) and 35-44 years (OR = 1.75, 95% CI = 0.99-3.10) age groups. Participants with a lower level of education (OR = 0.57, 95% CI = 0.37-0.89; p = 0.043) and who were unemployed (OR = 0.55, 95% CI = 0.36-0.84; p = 0.031) were significantly less aware of the vaccination programme.

ATTENDANCE FOR CERVICAL SCREENING

Respondents were also asked about their screening practices. 69.04% (n = 281) of respondents claimed to have attended for CS in the 3 years prior to the interview, with 72.28% (n = 203) of these attendees claiming that they go for screening more often than the recommended 3-yearly interval. The majority (84.78%) of those that have attended screening at least once in their life (n = 368) said that they attend for screening in the private healthcare sector. Among those participants who never attended screening or attended more than three years ago, the most common barriers mentioned were embarrassment,

fear of the test and fear of the result (Fig. 3). Regular attendees to CS (every 3 years) were significantly more likely to have a higher level of education (OR = 1.36, 95% CI = 1.10-1.78; $p < 0.001$), be married or separated (OR = 2.48, 95% CI = 1.56-3.94; $p < 0.001$), be in the 25-34 (OR = 2.36, 95% CI = 1.35-4.15; $p = 0.003$), 35-44 (OR = 4.90, 95% CI = 2.57-9.54; $p < 0.001$) or 45-54 (OR = 3.20, 95% CI = 1.70-6.02; $p < 0.001$) age groups, have children (OR = 1.63, 95% CI = 1.045-2.56; $p = 0.007$) and have a close family member with a history of cancer (OR = 1.72, 95% CI = 1.11-2.67; $p = 0.012$).

MULTIVARIATE LOGISTIC REGRESSION MODEL

Models (Tab. II) were computed for the outcome variables which reached the level of significance in the univariate analysis, mentioned above. In Model 1, the explanatory variables that remained statistically significant after adjusting the model for the other variables were:

- level of education (ISCED level): risk factor identification increased with increasing level of education;
- females who had a past positive diagnosis of HPV infection were significantly more knowledgeable than those who had not.

The outcomes of the second model which assessed the awareness of organised CS programme and the third model on the awareness of the national HPV vaccination programme (Tab. II) gave similar results. Females in the younger age groups (25-34 and 35-44) were significantly more aware of the presence of an organised CS programme at the National Screening Unit and the HPV vaccination programme.

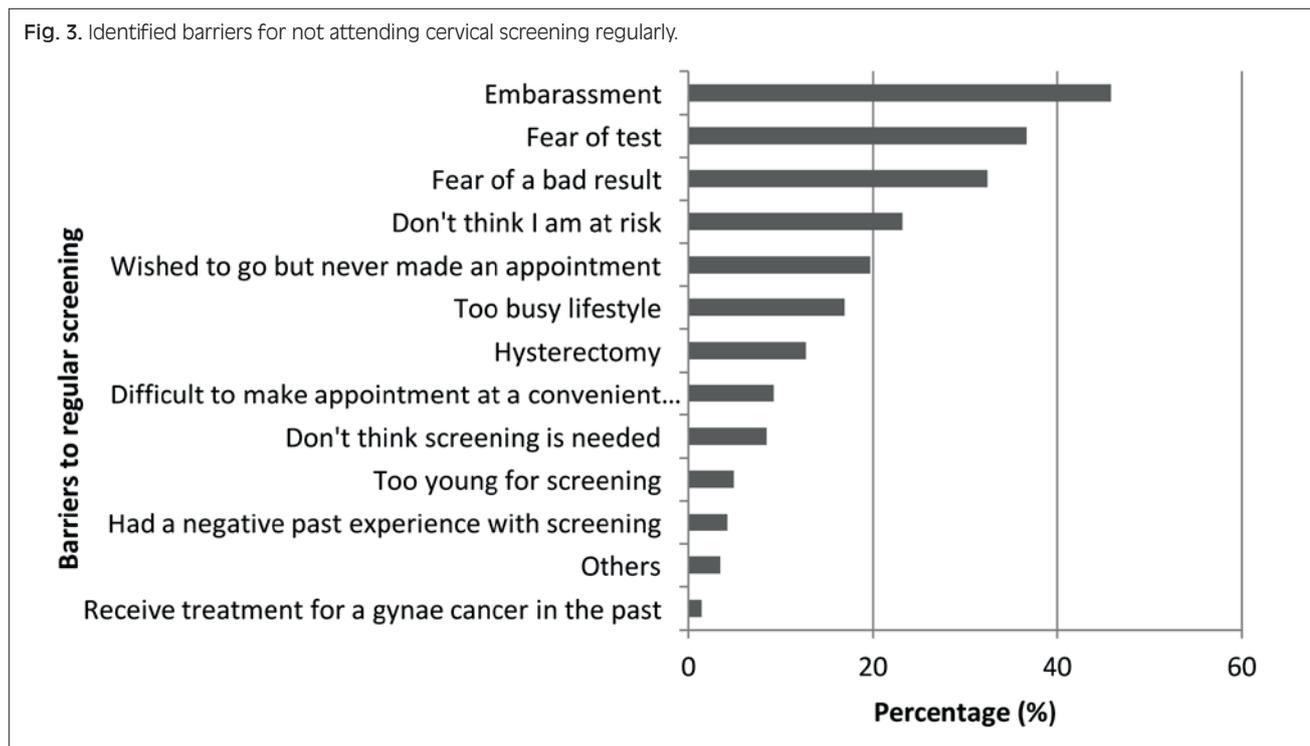
Model 4, assessed when the last smear test was done (less than 3 years, more than 3 years, never). The model resulted in three independent variables remaining statis-

tically significant. Females who attended screening regularly were from the younger age group (especially the 35-44 age group), had children and had a close family member who suffered from cancer in the past (Tab. II). No models were done for the outcome variables Total Symptom Score and Total Risk Factor score since they were only statistically significant associated with one variable – level of education.

Discussion

This study found moderate overall knowledge of CC symptoms which differed from local research regarding breast cancer symptoms where it was found that women in Malta were highly knowledgeable [16]. This may imply greater health promotion and health education on breast cancer compared to CC. The most recognised CC symptoms were post-menopausal bleeding, persistent pelvic pain and unexplained weight loss. Pain and weight loss are general symptoms of most cancers; participants might have acquired information on these symptoms from other cancer information campaigns. Health promotional messages in England were focused on increasing the knowledge of the three earliest CC symptoms: post-menopausal vaginal bleeding, post-coital bleeding and persistent foul smelling vaginal discharge [2, 14]. There is a need to increase the knowledge of these three symptoms in Malta, to help in their early recognition by the public and thus early referral to a health professional. Knowledge of CC symptoms increased with increasing level of education which was a common finding in the literature [2, 14] and may be attributed to people with higher level of education having a higher health literacy [17].

Fig. 3. Identified barriers for not attending cervical screening regularly.



Tab. II. Results of the multivariate logistic regression models.

	Variables	Univariate p-value	Multivariate p-value	Category p-value	Odds ratio (95% CI)
Model 1	ISCED	< 0.001		0.001	
	ISCED level 0-2		0.001		0.443 (0.273-0.719)
	ISCED level 3-4		0.887		0.955 (0.508-1.797)
	ISCED level 5-8 (reference)				1.000
	HPV infection in the past	0.036	0.023	0.023	
	Yes				1.66 (1.074-2.560)
	No (Reference)				1.000
	Age (25-34, 35-44, 45-54, 55-64 years)	0.001			
Model 2	Employment (gainfully employed or not)	0.014			
	Age group	< 0.001		<0.001	
	25-34 years		< 0.001		3.174 (1.745-5.772)
	35-44 years		< 0.001		3.122 (1.692-5.761)
	45-54 years		0.419		1.306 (0.683-2.497)
	55-64 years (reference)				1.000
	ISCED (ISCED level 0-2, 3-4, 5-8)	0.044			
	Employment (gainfully employed or not)	0.010			
	Civil status (married in the past or not)	0.029			
Model 3	Having children (yes or no)	0.011			
	Age group	< 0.001		0.002	
	25-34 years		0.018		2.015 (1.129-3.598)
	35-44 years		0.016		2.088 (1.150-3.791)
	45-54 years		0.611		0.851 (0.456-1.586)
	55-64 years (reference)				1.000
	ISCED (ISCED level 0-2, 3-4, 5-8)	0.043			
Model 4	Employment (gainfully employed or not)	0.031			
	Having children	0.007		0.001	
	Yes		0.001		2.705 (1.470-4.976)
	No (reference)				1.000
	Past history of cancer in a close family member	0.012		0.002	
	Yes		0.002		2.155 (1.332-3.488)
	No (reference)				1.000
	Age group	< 0.001		< 0.001	
	25-34 years		0.001		3.503 (1.667-7.362)
	35-44 years		< 0.001		4.302 (2.137-8.661)
	45-54 years		0.001		3.234 (1.570-6.662)
	55-64 years (reference)				1.000
	ISCED (ISCED level 0-2, 3-4, 5-8)	< 0.001			
Civil status (married in the past or not)	< 0.001				

CI: confidence interval.

The most recalled unprompted CC risk factor (43.24%) was sexual promiscuity which was again confirmed in the prompted questions. This finding was also prevalent in the literature where sexual behaviour was the most commonly recalled and recognised risk factor [2, 15, 18]. This study highlighted a very low awareness of HPV, also found by local and international studies conducted in England, France and Germany [2, 14, 19-24]. Despite having a national HPV vaccination programme and an organised CS programme, the knowledge of HPV remains low. This might indicate that both programmes are not being promoted effectively and fail to educate the public on the role of HPV in CC aetiology. It is important to highlight the role of HPV, different sexual partners

and smoking in the aetiology of CC as these are three important modifiable risk factors. Educational material on CC tends to deemphasise the mode of transmission of HPV to avoid associating CC to a Sexually Transmitted Disease. It is important not to cause an increase in the stigmatisation of CC which can be a barrier for screening attendance but females have a right to know the exact pathophysiology of CC in order to be empowered in taking decision regarding their sexual life [5, 18, 25, 26]. The first model showed that level of education and past HPV infection were the only two variables which remained statistically significantly associated with knowledge of risk factors. The positive effect of the level of education on the knowledge of CC risk fac-

tors was also documented in British and Italian studies [14, 15, 18, 27]. Low et al. (2012) and De Vito et al. (2014) found that females who received a result of an abnormal smear in the past where more knowledgeable as they had received advice and education from health professionals who delivered the diagnosis. An abnormal result might also have pushed them to seek more information on their condition.

When assessing the awareness of nationally available CC preventative services, this was low compared to England [2]. Of those who were aware of the programme there were a lot of misconceptions on who is currently being invited and at what frequency. Model 2 and Model 3 showed that age was the most significant variable, with the two younger age groups 25-34 years and 35-44 years, that is those who are currently being targeted by the screening programme, being significantly more knowledgeable. In studies conducted in England and France a positive effect of education on the overall knowledge of preventative services was also found [2, 23] but this was not found locally. This highlights the lack of promotion of these services, as both highly educated females and those with low level of education had low awareness of these services.

When it comes to CS practices 69.04% of the participants attended CS within the three years prior to the study with the majority of these attending within intervals less than the recommended three years [5] and in the private sector. This is a very similar figure to the European Health Interview Survey 2014 where 69.6% of the participants attended opportunistic CS within three years [11]. Therefore, if the national screening programme is to be extended to other age groups and kept at the recommended 3-year interval, the public should be educated on the benefits of screening and on the harms of over-screening such as over-treatment and increased psychological distress (anxiety). Discussions should also be conducted with health professionals who tend to recommend excessive use of screening in women with normal levels of risk factors [25].

Model 4 showed that regular attendees were more likely to be young, have children and have a close family member with a past history of cancer. Various literature works in Spain, Switzerland, Germany, Greece and the Netherlands also found that younger age groups attend for regular screening more because they are at the child-bearing age and therefore come into contact with gynaecological services more [28-32]. The same effect is therefore seen in women who have children. During these consultations they can be advised on the benefits of CS and given information on CC risk factors [28, 30-34]. Chorley et al. (2017) and Fylan (1998) also argued that post-menopausal women attend screening less as they might erroneously think that they are no longer at risk of CC. The systematic review conducted by Chorley et al. (2017) also agreed with the finding that females who have a close family member who suffered from cancer attend for CS more. Fear that close relatives of a cancer patient are more at risk of developing any type of cancer themselves might explain such finding and therefore

these relatives are more prone to engage in preventative services.

The most mentioned barriers for CS were embarrassment, fear of test and fear of bad result. Embarrassment of CS was attributed to the fact that pelvic examination is considered as intimate by women [2, 23, 35]. Fear of test resulted from lack of knowledge on the procedure itself and fear of pain. Fear of bad result comes from the common public perception that a cancer diagnosis is fatal and lack of believe that if diagnosed early it is more treatable [2, 23, 35]. The inclusion of an information leaflet with the CS invitation letter, explaining the procedure and highlighting the benefits of screening will reduce the fear of the test itself and incentivise women to attend for screening. There is also the need to increase the awareness that CS usually detects lesions which are pre-cancerous or non-invasive cancers, to decrease the fatalistic perceptions towards screening.

The results of this study should be interpreted in the light of this study's limitations: 1) although respondents and non-respondents, and respondents and the Maltese population had a similar distribution in terms of age and region of residence there might still be a selection bias in terms of other socio-demographic characteristics; 2) screening practices were based on self-reported data which might be susceptible to recall bias and also over-reporting due to social desirability; and 3) the cross-sectional methodology does not allow for causality to be determined. Nonetheless, it is the first national representative study with a high response rate that provided a picture of the local knowledge, awareness and attitudes on cervical cancer and screening.

Conclusion

In conclusion the outcomes of this study provide important information on the knowledge, awareness and attitudes of females in Malta on CC and CS. Through this study, various gaps in the knowledge of CC symptoms and risk factors were identified. This information should be used when planning future health promotion campaigns on CC, with the aim of increasing the knowledge on the role of HPV in CC and also to increase the ability of early symptoms recognition. These campaigns should especially target females of screening age with a specific focus on females having a low level of education. The identified attitudes and barriers towards CS should also be utilised and addressed in future health services planning. The implementation of such recommendations can empower females in Malta to prevent CC by reducing the risk of HPV infection and by attending regularly for screening services.

Key points

- To our knowledge, this is the first national representative study that provides information on the local knowledge, awareness and attitudes on cervical cancer and screening which can be of use in planning

health promotion campaigns and in health service planning particularly in further development of the national cervical cancer screening programme.

- The findings of this study infer that there is a moderate overall knowledge of cervical cancer symptoms and risk factors amongst 25-64-year-old females in Malta with females having a low education level being less knowledgeable.
- There was low awareness on preventative services available locally including the organised cervical screening programme and the availability of the HPV vaccine on the National Immunisation Schedule.
- A cervical screening rate of 69.04% was found, with many not following European guidelines.
- Participants who regularly underwent cervical screening were more likely to be young, have children and have a close family member with a past history of cancer.

Ethical approval

This study was approved by the Research Ethics Committee of the University of Malta.

Acknowledgements

Funding sources: this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

Authors contributed equally to this research work.

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Received on April 2, 2020. Accepted on June 12, 2020.

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How to cite this article: Deguara M, Calleja N, England K. Cervical cancer and screening: knowledge, awareness and attitudes of women in Malta. *J Prev Med Hyg* 2020;61:E584-E592. <https://doi.org/10.15167/2421-4248/jpmh2020.61.4.1521>

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