Malaysian Family Physician
Official Journal of the Academy of Family Physicians of Malaysia
and Family Medicine Specialist Association of Malaysia

ORIGINAL ARTICLE

Factors influencing pap smear screening uptake among women visiting outpatient clinics in Johor

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Chin SS, Jamonek NA, Hussin N, et al. Factors influencing pap smear screening uptake among women visiting outpatient clinics in Johor. *Malays Fam Physician.* 2022;17(2):46-55. https://doi.org/10.51866/oa.35

Keywords:
Pap smear, Papanicolaou, cervical cancer, knowledge, cancer screening

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Abstract

Introduction: Despite the benefits of cervical cancer screening, Pap smear uptake remains variable in Malaysia, with Johor previously reported as the state with the lowest uptake. This study aims to fill the gap in epidemiological knowledge and assess factors affecting the uptake of Pap smear screening among women in Johor.

Methods: A cross-sectional study was conducted in several government and private clinics across Johor, including Pagoh, Muar, Batu Pahat, Kulai, and Johor Bahru districts. Data was collected from 452 women using self-administered questionnaires, and logistic regression was performed to determine factors associated with Pap smear uptake.

Results: Findings showed that 48.5% of the women reported having undergone Pap smear screening in the previous 3 years, and 40.0% and 51.3% of respondents accurately answered questions on symptoms and risk factors of cervical cancer, respectively. Increasing age (OR_{adj} 2.322, 95% CI 1.708–3.158), being married (OR_{adj} 4.860, 95% CI 1.100–21.476), parity of ≥5 (OR_{adj} 8.381, 95% CI 1.326–52.958), young age at first pregnancy (OR_{adj} 0.932, 95% CI 0.877–0.991), knowledge of cervical cancer symptoms (OR_{adj} 1.745, 95% CI 1.065–2.857), support from family (OR_{adj} 3.620, 95% CI 2.081–6.298), and contraception use (OR_{adj} 2.220, 95% CI 1.314–3.750) were significantly associated with increased Pap smear uptake among women visiting outpatient clinics in Johor.

Conclusion: Pap smear uptake remains suboptimal in Johor, and broad-based awareness campaigns tailored towards improving knowledge of cervical cancer with family involvement are crucial to improving uptake among women in Johor.

Introduction

Cervical cancer is the fourth most common cancer among women both worldwide and in Malaysia.[1] The incidence of cervical cancer in Malaysia was 10.2 per 100,000 people in 2020, and a majority of these cases were diagnosed at late stages.[2] The Ministry of Health Malaysia reported an average of 2,000–3,000 hospital admissions for cervical cancer cases per year, with over RM50 million annual expenditure, and most of the funds were utilised for advanced-stage cases.[3]

Preventative actions for cervical cancer include the primary prevention approach of human papillomavirus (HPV) vaccination and secondary prevention that includes screening and treatment of precancerous lesions. The Pap smear is a safe, simple, and cost-effective screening tool for detection of precancerous and malignant cervical epithelial lesions. Precancerous cervical lesions often progress slowly and asymptomatically to invasive cancer, and these lesions can successfully be detected by a Pap smear. Pap smear was reported to be effective in reducing cervical cancer incidence by 30–78% in countries with proper implementation of screening programmes.[4]

Despite its clear benefits, Pap smear screening uptake has remained suboptimal since its introduction in Malaysia in 1969. Local guidelines recommend Pap smear screening in all women who are or had been sexually active between the ages of 20 and 65 years,[5] with free Pap smear screening tests provided at all government health facilities since 1995 as a national health initiative.[6] A study conducted in 57 countries reported a screening coverage of only 19% in developing countries, including Malaysia, compared with 63% in developed countries, which falls largely below the 70%

target set by the World Health Organization (WHO).[4]

The 5th National Population and Family Survey reported Johor as the state with the lowest Pap smear screening uptake at 39.9%,[7] and Pap smear uptake nationwide had fallen to 36.6% in the latest National Health and Morbidity Survey in 2019.[8] Local studies have likewise reported low Pap smear uptake ranging from 25% to 46%, with a majority of these studies focusing on Peninsular Malaysia, particularly Selangor and Kuala Lumpur.[9–13] Lack of knowledge was the most common barrier among participants in these studies, and other barriers, including limited healthcare access, education, and anxiety, were also reported to influence Pap smear uptake.[9–14]

There is a clear lack of studies investigating factors associated with Pap smear screening uptake in the southern regions of the Peninsula, including Johor, and this study was conducted to address this issue. Identification of these factors may provide valuable information to improve education and screening programmes for the community to increase Pap smear screening and, in turn, ensure earlier detection and treatment of cervical cancer.

Methods

Study design and population

A cross-sectional study was conducted in several government and private clinics across Johor, including the districts of Pagoh, Muar, Batu Pahat, Kulai, and Johor Bahru. The study participants consisted of consenting female patients aged 18 to 65 years who attended the outpatient clinics, were or had been married, and who were able to understand English or Malay. Patients diagnosed with cervical cancer, foreigners, and patients with acute and severely ill presentations were excluded from participation. Respondents were recruited using convenience sampling between June 2019 and August 2019.

Sample size determination

The sample size was calculated using the single proportion formula at 95% confidence interval with a 5% margin of error and an estimated proportion of 39.9% Pap smear uptake in the Johor population.[7] A final sample size of 443 subjects was calculated for this study, taking into consideration a 20% non-response rate.

Study procedure

Data collection was performed using self-administered questionnaires and anthropometric measurements. Prior to the questionnaire, all respondents were provided with a written and oral explanation of the purpose and methodology of the research and assurance of confidentiality. Respondents were also assured that participation was voluntary, and that they could refuse to participate at any time during the questionnaire, without any effect on the treatment they were seeking in the clinic. Written informed consent was obtained prior to administration of the questionnaire, and no identifiable information was collected.

Study instrument

The bilingual (English and Malay language) questionnaire used in this study was pretested and utilised in a prior local study in 2013,[14] and permission for its use was obtained from the lead author in 2018. The questionnaire covered sociodemographic factors, reproductive history, lifestyle behaviour, knowledge of cervical cancer symptoms, knowledge of cervical cancer risk factors, and attitude towards Pap smear cancer screening. Occupational status was denoted as 'professional' if the occupation required specialised knowledge and skills (e.g., teachers, lawyers), and 'non-professional' if the job scope was largely repetitive or manual (e.g., cashiers or food workers). Knowledge was assessed by multiple-choice questions regarding the symptoms and risk factors of cervical cancer, with participants being graded as 'correct' in a particular domain if they chose the correct answer. Health attitude was assessed using questions regarding the source of the participants' information on cervical cancer, contraception practices, willingness to have a male doctor perform the Pap smear, and the choice of family and social support in case of symptoms.

Data analysis

Data analysis was performed using SPSS software version 16.0 for Windows. Categorical data, such as ethnicity and marital status, are presented as frequency and percentages. Simple logistic regression analysis was conducted to test for factors associated with Pap smear screening uptake with a 95% confidence interval. Variables with a p-value less than 0.25 in the univariate analysis were subsequently included in the multiple logistic regression model for further analysis to determine significant association with Pap smear uptake. The results are presented as adjusted odds ratio (OR_{adj}), and a p-value of less than 0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Medical Research and Ethics Committee (MREC), National Institute of Health Malaysia (NMRR-19-105-45960).

Results

A total of 456 women were approached for the survey, and 452 women participated, with a response rate of 99.1%. The mean age of the respondents was 37.7 ± 11.5 years. Most participants were of Malay ethnicity (79.4%), had secondary education (50.4%), were married at the time of the study (87.6%), had a non-professional occupation (41.4%), and had a monthly personal income of less than RM2500 (63.3%) (Table 1). The mean age at first pregnancy was 20.9 ± 10.0 years, with most participants reporting a parity ranging between one and four. The respondents predominantly did not have underlying chronic medical illnesses (69.7%), were obese (36.3%), and did not perform regular physical activity (55.5%) (**Table 1**).

Of the 452 women involved in the study, 219 (48.5%) reported having undergone Pap smear screening in the previous 3 years.

Table 1. Sociodemographic characteristics of respondents (N=452).

Characteristics	N (%)
Age group (years)	37.7 ± 11.5
<20	7 (1.5)
20–29	126 (27.1)
30–39	134 (29.6)
40–49	91 (20.1)
50–59	83 (18.4)
≥60	11 (2.4)
Ethnicity	
Malay	359 (79.4)
Chinese	53 (11.7)
Indian	31 (6.9)
Other	9 (2.0)
Education level	
No education or primary education	67 (14.8)
Secondary education	228 (50.4)
Tertiary education	157 (34.8)
Marital status	
Married	396 (87.6)
Divorced or widowed	56 (12.4)
Occupational status	
Professional	89 (19.6)
Non-professional	187 (41.4)
Not working	176 (39.0)
Monthly personal income	
<RM2500	286 (63.3)
RM2500–RM5000	115 (25.4)
>RM5000	51 (11.3)
Parity	
Nulliparous	73 (16.2)
1–4	284 (62.8)
≥5	95 (21)
Age at first pregnancy (years)	20.9 ± 10.0
Nulliparous	75 (16.6)
<20	34 (7.5)
20–29	293 (64.8)
30–39	49 (10.8)
≥40	1 (0.2)
Chronic medical illness	137 (30.3)
BMI	
Underweight	26 (5.8)
Normal	114 (25.2)
Overweight	148 (32.7)
Obese	164 (36.3)
Regular exercise	201 (44.5)

Approximately 40.0% and 51.3% of respondents were able to correctly answer the questions pertaining to the symptoms and risk factors of cervical cancer, respectively (**Table 2**). Most women in the study received information on Pap smears from government healthcare services (60.2%), with 59.1% of respondents receiving support from their family to undergo a Pap smear. The participants were predominantly unwilling to undergo a Pap smear with a male doctor (80.1%), cited their husbands as the first person to approach in the presence of symptoms (67.5%), needed moral support (52.7%), and did not practice contraception (67.5%) (**Table 2**).

Table 2. Knowledge and behavioural patterns of respondents (N=452).

Characteristics	N (%)
Knowledge of cervical cancer symptoms	
Correct answers	181 (40.0)
Postcoital bleed	66 (14.6)
Abnormal vaginal discharge	60 (13.3)
Intermenstrual bleed	44 (9.7)
No symptoms	11 (2.4)
Incorrect answers	271 (60.0)
No menstruation	62 (13.7)
Others (pruritus, increased abdomen size)	8 (1.8)
Did not know	201 (44.5)
Knowledge of risk factors of cervical cancer	
Correct answers	232 (51.3)
Family history	141 (31.2)
Multiple sex partners	91 (20.1)
Incorrect answers	220 (48.7)
Uncircumcised partner	5 (1.1)
Other (surgery, fatty diet)	7 (1.8)
Did not know	208 (46.0)
Sources of information on Pap smear	
Never received information	61 (13.5)
Government healthcare	272 (60.2)
Private healthcare	23 (5.1)
Family or friends	39 (8.7)
Campaigns or mass media	31 (6.8)
Magazines or brochures	26 (5.8)
Support from family to undergo Pap smear	
Yes	267 (59.1)
First person to approach if symptomatic	
Nobody	44 (9.7)
Husband	305 (67.5)
Mother or sibling	85 (18.8)
Friends	3 (0.7)
Others	15 (3.3)
Requiring support if symptomatic	
None	50 (11.1)
Moral support	238 (52.7)
Physical support	94 (20.8)
Informational support	67 (14.8)
Others	3 (0.6)
Contraception	
None	305 (67.5)
Oral contraceptive pill	73 (16.2)
Injection	33 (7.3)
IUCD	15 (3.3)
Barrier	11 (2.4)
Others	15 (3.3)

Following multivariate analysis, older age (OR_{adj} 2.322, 95% CI 1.708–3.158), being married (OR_{adj} 4.860, 95% CI 1.100–21.476), parity ≥5 (OR_{adj} 8.381, 95% CI 1.326–52.958), young age at first pregnancy (OR_{adj} 0.932, 95% CI 0.877–0.991), knowledge of cervical cancer symptoms (OR_{adj} 1.745, 95% CI 1.065–2.857), support from family (OR_{adj} 3.620, 95% CI 2.081–6.298), and contraceptive use (OR_{adj} 2.220, 95% CI 1.314–3.750) were significantly associated with increased Pap smear uptake among women in Johor (**Table 3**).

Table3. Factors associated with Pap smear uptake among women in Johor.

VARIABLES	PAP SMEAR UPTAKE		Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
	Yes N (%)	No N (%)				
Age (years)	37.7 ± 11.5		1.095 (1.073–1.118)	<0.001	2.322 (1.708–3.158)	<0.001
Ethnicity						
Malay	174 (48.5)	185 (51.5)	ref			
Chinese	31 (58.5)	22 (41.5)	1.498 (0.835–2.687)	0.175	1.617 (0.745–3.508)	0.224
Indian	11 (35.5)	20 (64.5)	0.585 (0.272–1.256)	0.169	0.674 (0.251–1.804)	0.432
Other	3 (33.3)	6 (66.7)	0.532 (0.131–2.159)	0.377	0.462 (0.089–2.388)	0.335
Education level						
No education or primary education	24 (35.8)	43 (64.2)	ref	0.056		
Secondary education	112 (49.1)	116 (50.9)	0.578 (0.329–1.015)	<0.001	1.164 (0.579–2.342)	0.670
Tertiary education	97 (61.8)	60 (38.2)	0.345 (0.191–0.625)	<0.001	0.950 (0.415–2.172)	0.903
Marital status						
Married	215 (54.3)	181 (45.7)	15.442 (5.48–43.515)	<0.001	4.860 (1.100–21.476)	0.037
Divorced or widowed	4 (7.1)	52 (92.9)				
Occupational status						
Professional	33 (37.1)	56 (62.9)	0.631 (0.374–1.063)	0.084	1.048 (0.515–2.130)	0.898
Non-professional	101 (54.0)	86 (46.0)	1.257 (0.832–1.899)	0.277	1.680 (0.993–2.841)	0.053
Not working	85 (48.3)	91 (51.7)	ref			
Monthly personal income						
<RM2500	138 (48.3)	148 (51.7)	ref			
RM2500–RM5000	53 (46.1)	62 (53.9)	0.917 (0.594–1.415)	0.695		
>RM5000	28 (54.9)	23 (45.1)	1.306 (0.718–2.375)	0.382		
Parity						
Nulliparous	11 (15.1)	62 (84.9)	ref			
1–4	137 (48.3)	147 (51.7)	5.253 (2.655–10.391)	<0.001	4.809 (0.724–31.955)	0.104
≥5	71 (74.7)	24 (25.3)	16.674 (7.562–36.769)	<0.001	8.381 (1.326–52.958)	0.024
Age at first pregnancy (years) Chronic medical illness	20.9 ± 10.0		1.796 (1.423–2.269)	<0.001	0.932 (0.877–0.991)	0.024
Yes	93 (67.9)	44 (32.1)	3.170 (2.076–4.843)	<0.001	1.141 (0.604–2.157)	0.685
No	126 (40.0)	189 (60.0)				
BMI						
Underweight	5 (19.2)	21 (80.8)	ref			
Normal	42 (36.8)	72 (63.2)	2.450 (0.860– 6.980)	0.093	1.270 (0.337–4.784)	0.724
Overweight	69 (46.6)	79 (53.4)	3.668 (1.313–10.248)	0.130	1.394 (0.379–5.123)	0.617
Obese	103 (62.8)	61 (37.2)	7.092 (2.543–19.774)	<0.001	1.999 (0.539–7.417)	0.300
Regular exercise						
Yes	94 (46.8)	107 (53.2)	0.886 (0.611–1.284)	0.521		
No	125 (49.8)	126 (50.2)				

VARIABLES	PAP SMEAR UPTAKE		Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
	Yes N (%)	No N (%)				
Knowledge of cervical cancer symptoms						
Yes	99 (54.7)	82 (45.3)	1.519 (1.041–2.218)	0.030	1.745 (1.065–2.857)	0.027
No	120 (44.3)	151 (55.7)				
Knowledge of risk factors of cervical cancer						
Yes	105 (45.3)	127 (54.7)	0.769 (0.531–1.113)	0.769		
No	114 (51.8)	106 (48.2)				
Support from family to undergo Pap smear						
Yes	148 (67.6)	119 (51.1)	1.997 (1.363–2.926)	<0.001	3.620 (2.081–6.298)	<0.001
No	71 (32.4)	114 (48.9)				
Willingness to have a male doctor perform the Pap smear						
Yes	50 (55.6)	40 (44.4)	1.428 (0.897–2.271)	0.133	1.183 (0.650–2.155)	0.582
No	169 (46.7)	193 (53.3)				
Having a person to approach first if symptomatic						
Yes	195 (47.8)	213 (52.2)	0.763 (0.409–1.424)	0.396		
No	24 (54.5)	20 (45.5)				
Requiring support if symptomatic						
Yes	188 (46.8)	214 (53.2)	0.538 (0.294–0.985)	0.042	0.956 (0.451–2.024)	0.906
No	31 (62.0)	19 (38.0)				
Contraception use						
Yes	96 (65.3)	51 (34.7)	2.785 (1.849–4.195)	<0.001	2.220 (1.314–3.750)	0.003
No	123 (40.3)	182 (59.7)				

Discussion

The percentage of Pap smear uptake in the previous 3 years among the women in this study was 48.5%. This finding corroborates a report published in a local study.[9] The Pap smear uptake in this study appeared to be slightly higher than the uptake reported in the Fifth Malaysian Population and Family Survey (MPFS-5) 2014 and the National Health Morbidity Survey 2019, which reported that only 39.9% and 36.6% of eligible women in Johor and nationwide had undergone Pap smear testing within 3 years, respectively.[7,8] The difference in uptake is small, but it may reflect an increasing awareness of cervical cancer screening among women in Johor over time. Despite our study reporting a comparable percentage of uptake with other local studies, the results were still suboptimal in comparison to developed countries, such as the United Kingdom, Argentina, and Finland.[4]

In other states in Malaysia, a higher uptake of Pap smear screening was seen among university staff in Nilai,[10] urban women in Selangor,[11] and working women in Kedah.[15] This difference may be attributable to the higher socioeconomic and education levels of the respondents in these studies; university staff are presumably more educated on health-related matters, and peer information-sharing may be a contributing factor in encouraging Pap smear uptake.[10] The sample in the Selangor study was confined to government health centres,[11] where active promotion of cancer screening with a monthly target of screened cases is likely to be in place and may have influenced the higher uptake rate.

Despite the introduction of Pap smear screening to local healthcare in 1969, most Malaysian women lack awareness of the importance of Pap smears in cervical cancer detection. Fewer than half of our respondents had adequate knowledge of cervical cancer symptoms, a finding consistent across previous local studies.[10,14,15–17] Only half of our respondents displayed adequate knowledge regarding the risk factors of cervical cancer. This lack of knowledge of cervical cancer risk factors was also demonstrated in a study conducted at a public university in Nilai.[11]

Our study showed that increased knowledge of cervical cancer symptoms was significantly associated with a higher Pap smear uptake, a finding corroborated by local and international studies.[8,18] A mere 2.4% of participants in our study were able to answer that cervical cancer could be asymptomatic, which may be a significant factor in the low Pap smear uptake in the community. Lack of awareness of the asymptomatic early stages of cervical cancer may predispose these women to default Pap smear screening intervals and opportunities to detect and manage these lesions early. This finding highlights the asymptomatic phase of cervical cancer as a crucial area to address in public health education and to facilitate improved public understanding of cancer progression and the importance of regular Pap smear screening. Abdullah et al. found poor Pap smear uptake among secondary school teachers, highlighting that this lack of knowledge regarding cervical cancer and its screening did not only affect women of lower educational backgrounds, and that this gap in knowledge was more likely to be found in women who had never had a Pap smear.[12] A systematic review and meta-analysis found that the use of theory-based cervical cancer education interventions significantly increased Pap smear screening uptake, particularly when communities with low literacy levels were targeted for such interventions.[19] It is therefore imperative for health care providers to improve the education of women regarding cervical cancer to better improve their health awareness in actively seeking screening tests and ultimately lead to earlier disease detection.

Support from the woman's family to undergo a Pap smear was shown to be a significant predictor for Pap smear screening uptake in this study, with local and foreign studies showing a similar positive association.[10,17] Encouragement from the family assisted in motivating the women to undergo screening and helped to reduce anxiety and fear. Most of the women in our study also reported their spouse as their first person to approach if they developed symptoms suggestive of cervical cancer. This phenomenon is especially prevalent in Asian countries, where most societies are patriarchal by nature and men typically lead the household. These findings highlight an important and commonly overlooked aspect of Pap smear screening, which is the involvement of men and their role in supporting this essential screening of their partners. Therefore, programmes promoting awareness and information on cervical cancer and screening should be broadened to not only the woman but to their spouse and family as well.

Contraception practice was another modifiable factor shown to be significantly associated with increased Pap smear uptake in this study, a finding that corroborated previous studies.[11,20] The practice of family planning may be associated with increased knowledge and awareness of women's health, and these women may in turn receive education on cervical cancer screening during such appointments. Most of the respondents in our study, however, did not practice contraception or regular physical activity and were obese, which highlights a lack of positive health behaviours. It is therefore imperative for health counselling on cervical cancer screening to not be restricted to women who only present for obstetric or gynaecologic services, as these represent only a subset of the eligible women for Pap smear screening.

The women in our study cited the government as their primary source of information on cervical cancer screening, and this finding reflects a regular and familiar interaction between the public and the government health system. This finding also reveals the strategic position of government workers as the best intermediary to dispense accurate information on cervical cancer to the public. The importance of cancer information on screening uptake had been emphasised in a previous study acknowledging physician recommendation as one of the strongest predictors of cancer screening uptake.[20,21] Proper training and regular knowledge updates from the government are therefore vital to improving the education of the public. Government health outreach programmes can be tailored to be implemented in the community, rather than being institution-based, to facilitate the involvement of more women who may face difficulties or anxiety when visiting health facilities. Social media incorporation can increase effectiveness in disseminating information and correcting public misconceptions that may otherwise impede Pap smear uptake.

Our findings showed that married women were five times more likely to undergo Pap

smear testing, a pattern consistent with other studies.[12,14,16] The influence of marital status on Pap smear uptake is due to the increased likelihood of married women obtaining obstetric and family planning services, in which opportunistic counselling on cervical cancer screening may occur.

We also found that a younger age at first pregnancy and a parity ≥5 were associated with increased Pap smear uptake, a finding corroborated by other studies.[12–14] The opportunistic exposure to cervical cancer information during frequent obstetric and child care clinic visits could be the contributing factor of higher Pap smear uptake among these women, which suggests an increasingly younger target population for cervical cancer screening information to improve awareness and screening uptake.

An increasing age was also found to be a factor strongly associated with Pap smear uptake, a finding concordant with many studies,[12–14] and which is likely due to the increased frequency of clinic visits and disease screening tests over time.

Our study found no significant association between the willingness to undergo a Pap smear when a male physician was performing the procedure and Pap smear uptake. This finding contrasted an Asian study reporting a preference for female doctors for performing Pap smears or examinations on intimate parts of the body and citing embarrassment as a potential barrier to undergoing a Pap smear.[22] This surprising finding may highlight an increasingly open-minded female community or the possibility of past obstetric or gynaecologic experience with male health providers.

Pap smear screening differs across countries, and these screening programmes are generally categorised into two types: opportunistic screening and organised screening.[23] The Pap smear screening programme in Malaysia is currently of the opportunistic type, which makes use of patient encounters at a health facility to offer the screening service. Opportunistic screening, while recording information from the smears, does not have a universal registry of all women eligible for screening, and thus omits those who do not otherwise present to health facilities. Organised screening is recommended by international organisations such as the WHO, due to direct optimisation of participants. Organised screening is provider-initiated and utilises an integrated health care system linked to a population-based registry.[24] Direct notifications for screening appointments are sent to eligible women at designated intervals. The drawback of organised screening is the complexity of the linked system and resource-heavy demands. Pap smear uptake is shown to be higher in developed countries, such as Australia and Singapore, with organised screening programmes, highlighting a better coverage using the system.[25,26] In addition to addressing the factors investigated in the study, a gradual transition to organised screening for Pap smears would be beneficial to expand coverage to women who would otherwise be missed during visits to healthcare facilities. A significant transition would likely require collaboration between the health ministry authorities, private medical organisations, and legal and data expertise.

The findings of our study address the gap in the literature, particularly for the southern region of Peninsular Malaysia, and provide insights into primary care providers regarding factors that influence Pap smear uptake. Our study utilised self-administered questionnaires without confirmation of clinical records and is therefore vulnerable to response bias, though we had aimed to minimise such bias by maintaining the anonymity of the respondents. The use of the bilingual questionnaire may have also limited the range of respondents to those who were proficient in only English or the Malay language. As the study was limited to women attending outpatient clinics in the state of Johor, it may also be difficult to generalise the study findings to all women in the state and in Malaysia. Further elucidation of social or personal barriers faced by the participants in undergoing Pap smear screening and participant recommendations to overcome them were not explored in this study. These aspects should be addressed in future studies, as they could provide insight into the expectations of women when they seek screening from primary health care facilities and improvements to services that could be made to encourage Pap smear uptake.

Conclusion

In conclusion, our study showed that Pap smear screening uptake remains suboptimal in Johor, which mirrors the findings in other states in Malaysia. The factors significantly

associated with increased Pap smear uptake in this study included increasing age, being married, having a parity of five or more, younger age at first pregnancy, knowledge of cervical cancer symptoms, support from family, and contraception use.

It is therefore vital for policy makers and the government to tailor public health initiatives to target knowledge and positive health behaviour and to broaden these programmes to not only involve women but also their families.

Education efforts regarding cervical cancer and Pap smear screening do not necessarily have to begin at antenatal or gynaecologic visits and should be broadened to young women before marriage and initiation of sexual activity; this should be achieved through public health engagement in secondary schools, tertiary institutions, and workplaces. The use of brochures and factsheets can be complemented by strong promotion via social media to spread awareness among an increasingly tech-savvy population.

These efforts should not stop at the woman in question. Engaging husbands and other family members may be essential to ensuring a holistic approach in the early detection of cervical cancer. Opportunistic counselling regarding cervical cancer risk and Pap smears can be provided to members of the public—health consultations represent one of these many opportunities. Healthcare workers who are in constant contact with patients should keep abreast of developments in cervical cancer screening to ensure accurate dissemination of health information.

The integration of a Pap smear screening programme with a population-based cancer registry may significantly improve coverage of eligible women who may otherwise be missed during opportunistic visits to health clinics. Such an integration necessitates national collaboration between the health ministry authorities, private medical organisations, and legal and data expertise.

It is through addressing the factors that have been investigated in this study that improved health policies and programmes may be put into place to ensure effective education regarding Pap smear screening, and lead to early detection and treatment of cervical cancer.

Acknowledgements

The authors would like to express their sincere gratitude to Dr. Noorhaida Ujang and Dr. Helmi Khairani of Pejabat Kesihatan Daerah Muar for their endless support in the study, and to Dr. Mohd Azahadi Omar and the biostatistics team at the National Institutes of Health (NIH) for their guidance in the statistical analysis of the study.

Conflicts of interest

All authors declare no conflicts of interest.

How does this paper make a difference to general practice?

- This study provides insight into the factors associated with Pap smear uptake, which may be targeted to improve the uptake, especially at a primary care level.
- Factors including knowledge regarding cervical cancer and support from family are associated with a better screening uptake, which suggests that broader education on cervical cancer awareness that is targeted not only to women but also their families may be optimal in outreach programmes.
- This study adds to the knowledge base on Pap smear uptake in Johor, and the current uptake in the state remains suboptimal and needs improvement.

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