



PRIMARY HEALTH CARE PHYSICIAN KNOWLEDGE AND PRACTICE REGARDING COUNSELLING AND SCREENING OF PROSTATE CANCER IN DAMMAM CITY, EASTERN PROVINCE KSA

General Medicine

Abdullah Ali Khunain *	MD Family medicine resident, Family Medicine Academy, First Health Cluster Eastern province, Saudi Arabia. *Corresponding Author
Hamoud Saleh Alanazi	MD Family medicine resident, Family Medicine Academy, First Health Cluster Eastern province, Saudi Arabia.
Mohamed Ali Alamin	MBBS, MPH, MD, GH-LPM Research coordinator, SPFMP, EP, MOH, Family Medicine Academy, First Health Cluster Eastern province, Saudi Arabia.

ABSTRACT

Prostate cancer (PC) is the third most frequent cancer in the eastern region. Screening may prevent death or metastasis. However, the risk of false-positive results, overdiagnosis and other complications after screening is a significant issue. Primary health care physicians (PHCP) should be aware of the recent recommendations about PC screening.

Aims: To assess knowledge and practice of PC screening and counselling among PHCP.

Methods and Material: A cross-sectional descriptive study

Study population & settings: All PHCP at Ad Dammam city Ministry of health.

Results: A significant proportion are offering screening outside the recommended age (42.5%). Most respondent chose PSA as screening tool (78.8%). About two thirds (61.3%) agree that PSA screening has high false-positive results. Long experience, working in geriatric clinic, Follow PC patient or high postgraduate qualifications are significantly increase knowledge about PC. 52% frequently offers to screen for asymptomatic patient in the age group 55-69. Older physicians, those who have longer experience and those who see more patients are more likely to screen. 10% would counsel every patient about the benefit and harm of screening, while 35% would never counsel before the screening. The odds of practicing prostate cancer screening is 5 times higher for those who did not attend the training course. OR 5.0.54 (95% CI 1.062 to 24.06).

Conclusions: Our findings suggest that PHCP should be aware about the recent recommendations. The need for national PC screening guideline is essential. PHCP should attend cancer screening course or have post graduate qualifications to be aware about the recent recommendations. Also, they should work in geriatric clinic or urology clinic during their undergraduate or postgraduate training to increase their knowledge.

KEYWORDS

Prostate Cancer, Primary Care, Screening, Prostate Specific Antigen.

INTRODUCTION:

List of abbreviations:

PSA	Prostate-Specific Antigen
PC	Prostate Cancer
SCR	Saudi Cancer Registry
ERSPC	European Randomized Study of Screening for Prostate cancer
PLCO	Prostate, Lung, Colorectal, Ovarian cancer trial
USPSTF	The United States Preventive Services Task Force
DRE	Digital Rectal Examination
PHC	Primary Health Care
PHCP	Primary Health Care Physicians
CME	Continuing Medical Education
MOH	Ministry of Health
SPSS	The Statistical Package for the Social Sciences
GP	General Practitioner
FM	Family Medicine

Prostate cancer (PC) is the most commonly diagnosed cancer in united states among men and the second leading cause of cancer death(1). Prostate-specific antigen (PSA) testing in the past was used as a tumor marker for cancer recurrence and progression, in the early 1990s, PSA was recommended by the professional societies as a screening tool for prostate cancer which led to a dramatic increase in the incidence of prostate cancer (2)(3). The majority of the diagnosed cancers were clinically localized, which led to an increase in the aggressive treatments intended to cure these early-stage cancers (4).

In Saudi Arabia, Prostate cancer is the fourth most frequent cancer among men according to the Saudi Cancer Registry (SCR), and third in the Eastern region (5). Screening for Prostate cancer has been a topic of discussion in the past decades, multiple large clinical trials including the European Randomized Study of Screening for Prostate Cancer (ERSPC) and the United States Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial was established to assess the benefits and harms of PSA screening. In the ERPS, 182,160 men between the ages of 50 and 74 were randomly assigned to PSA screening or a control group that was not offered to screen, the primary

outcome of prostate cancer mortality was 21 percent lower in the group offered screening (rate ratio [RR] 0.79, 95% CI 0.69-0.91) (6).

In the PLCO trial, 76,693 men aged 55 to 74 years were randomly assigned to annual screening with PSA and digital rectal examination (DRE) or to usual care, which often included PSA and DRE, the study found no reduction in the primary outcome of prostate cancer mortality (RR 1.04, CI 0.87-1.24) (7).

The United States Preventive Services Task Force (USPSTF) final recommendation for PC screening stated that the screening should be individualized for men aged between 55-69 years and the patient should be counseled about potential benefits and harms of screening (8). Also, the American College of Physicians, American Cancer Society, American Urological Association and the Canadian Task Force on the Periodic Health Examination stress the importance of informed decision making between the physician and the patient (9-12).

Many men will experience potential harm of screening including false-positive results or overdiagnosis which require further investigations and management (13)(14). A patient who underwent a biopsy after abnormal PSA experienced complications consisting of, pain, infection, bleeding, or urinary difficulty (15-18).

Primary health care physicians (PHCP) should be aware how to counsel the patient about the benefit and harm of screening and treatment before start screening, and when to refer them for further investigation. In Saudi Arabia study done in Riyadh 2009 among PHCP revealed that nearly half of the physicians were counseling and screening for prostate cancer with 54% correct knowledge score (19). Another study done in Ireland in 2009 to assess the factors promoting PSA testing found that 79% of the general practitioners are screening asymptomatic men with PSA test, 34% of them would test asymptomatic men younger than 50 years, and 51% of them would continue screening after the age of 70 years (20).

A cross-sectional study involved 969 participants done in Ontario Canada 2010 to assess the attitude and practice of PC screening among

family physicians showed that most physicians begin offering to screen at age 50 (72.9%) and stop at ages 70 or 80 (68.4%); 17.9% offer lifelong screening and 8.3% of the physicians do not offer prostate cancer screening. Most of them (80.97%) use PSA and DRE for screening; 9.4% use DRE alone and 7.15% PSA only. Forty-three percent of the physicians agree that screening with PSA provides survival benefits and 51 % agreed that the benefits of prostate cancer screening outweigh the risks. (21), an updated on this study involving 1880 family physicians published on 2018 after the release of the recent PC screening recommendation found that 80.4% of the physicians offered prostate cancer screening compared to 91.7% when surveyed in 2010. Physicians new to practice (two years or less) were the most likely to not offer to screen (24.6%). The majority (72.6%) of respondents feel PSA screening leads to overdiagnosis and treatment. (22)

In Malaysia, a study done in 2016 showed that half of the general practitioner would screen and perform a PSA test despite the lack of consensus on prostate cancer screening. They did not routinely involve men in making an informed decision about prostate cancer screening (23).

Study Aim

To assess the knowledge and practice of Prostate cancer screening and counselling among PHCP in Dammam city.

Study Objectives

- To measure the PHCP knowledge about Prostate cancer screening and counseling.
- To measure the PHCP self-reported practice regarding Prostate cancer screening and counseling in PHC setting.
- To study the associated factors with knowledge and practice of prostate cancer counseling and screening among PHCP.

METHODOLOGY

Study Design

A cross-sectional descriptive study

Study Population & Settings

Primary health care physicians at Ad Dammam city MOH PHC centers, Eastern Province, KSA 2019.

Inclusion/ Exclusion criteria

Inclusion: All GP, Family medicine resident, specialists and consultants.

Exclusion: Physicians working in administration and not seeing patients.

Sampling

All primary health care physicians working at Ad Dammam sector who meet the inclusion criteria will be included in this study (non sampled).

Study variables

DEPENDENT:

- PHCP knowledge about Prostate cancer screening and counseling
- PHCP self-reported practice about Prostate cancer screening and counseling

INDEPENDENT:

- Physicians' demographic characteristics, age, gender, post graduate qualifications,
- Work related characteristics, involved in geriatric care, attend prostate cancer or geriatric courses length of practice, and number of patients per day.

Data collection methods and technique

A self-administered questionnaire developed based on the final recommendation from the USPSTF (8). We performed content and face validation of the questionnaire among five healthcare professionals who have expertise in primary health care. The questionnaire was modified based on the feedback from the expert panel. A pilot study was conducted to look at the feasibility and acceptability of the study. The questionnaire had 3 main sections on: (1) Physicians' profile (2) Knowledge about prostate cancer counseling and screening (3) Self-reported practice about prostate cancer counseling and screening.

Data collection was carried out from July 2019 to December 2019. Six undergraduate students participated as data collectors.

Ethical Considerations

This study was approved by the Ethics Committee of the Family medicine academy in the eastern province. The study participants were informed about the study purpose and answered the questionnaire anonymously; they were free to skip any item they did not wish to answer.

Statistical Analysis

We used the Statistical Package for Social Sciences (SPSS) V.21.0 to manage and analyze the data.

Percentages were used to summaries categorical data. Mean and SD were used to describe continuous variables which were normally distributed. We used independent-sample t-test, one-way ANOVA test and Chi-square test to find the association between independent and dependent variables.

Logistic regression analysis was performed to measure the effect of independent factors on PHCP decision to screen for prostate cancer.

An alpha level of 0.05 used and p value less than 0.05 considered significant.

RESULTS

1.Descriptive Results

Of the 133 PHC physicians invited, 80 responded translated to the response rate of 60.1%

Demographic predictors		Count	%
Gender	Female	40	50.0%
	Male	40	50.0%
Job Title	Fm specialist/ consultant	16	20.0%
	FM resident	34	42.5%
	GP	30	37.5%
Worked in geriatric clinic	No	60	75.0%
	Yes	20	25.0%
Attended training course in geriatric care in the last 5 years	No	53	66.3%
	Yes	27	33.8%
Attended training course in cancer screening the last 5 years	No	58	72.5%
	Yes	22	27.5%
Participated in awareness rising events related to prostate cancer	No	69	86.3%
	Yes	11	13.8%
Follow up prostate cancer patient	No	68	85.0%
	Yes	12	15.0%
	Range	Mean	SD
Age	(25-59)	33.84	8.279
Years of experience	(1-27)	7.31	6.944
Average patient seen daily	(3-80)	24.54	15.636

Table 1 shows general Characteristics of respondents. The mean age was 33.8 +/- 8.27years (range 25-59). The mean years of experience is 7.31 +/- 6.9 years. The average patient seen each day is 24 +/- 15 patient, with range of 3-80 patient each day.

Sixteen of the participant were qualified family physician specialist or consultant (20%), 34 were FM resident (42%), and 30 GP (37.5%) .

Twenty physician have previous experience in geriatric care (25%) , and 27 participant did attend geriatric care course in the last 5 years (33.8).

Eleven physician participated in awareness rising events related to prostate cancer (13.8%)During their practice, 12 physician did follow up prostate cancer patient (15%), 22 of our participants attend course in cancer screening in the last 5 years (27.5%).

Table 2. Clinical practice improvement needs

Clinical practice improve ment factors		Count	%
Do you think there is a need for decision aid brochure for prostate cancer screening?	No	14	17.5%
	Yes	66	82.5%
Do you think there is a need for extensive courses about Prostate cancer to improve your knowledge in this topic ?	No	14	17.5%
	Yes	66	82.5%
Do you think there is a need for national guideline for prostate cancer screening ?	No	6	7.5%
	Yes	74	92.5%

Table 2 shows sixty six respondents need extensive courses about prostate cancer screening and management (82%), 74 (92%) physician think there is a need for national guideline for prostate cancer screening, 66 (82%) physician need decision aid brochure for prostate cancer screening.

Table 3. Respondent s knowledge about prostate cancer screening and risk factors

Physician Knowledge	N	%	Physician Knowledge	N	%
recommended age to start screening (55)	44	55.0%	Increased age (over 50 years) (increases risk)	68	85.0%
recommended age to stop screening (70)	18	22.5%	1st degree relative with prostate cancer (increases risk)	72	90.0%
Screening done after shared decision between the patient and the physician	70	87.5%	Current smoking (does not affect risk)	5	6.3%
Recommended screening tool for prostate cancer (PSA)	63	78.8%	High dietary fat intake (does not affect risk)	19	23.8%
PPV of PSA <30% (correct)	13	16.3%	1st degree relative with breast cancer (increases risk)	30	37.5%
Prostate cancer diagnostic test (TRUS biopsy)	55	68.8%	BPH (does not affect risk)	11	13.8%
PC screening and early treatment decrease the death significantly (False)	15	18.8%	Coffee consumption (does not affect risk)	33	41.3%
Pain , bleeding, fever, urinary incontinence, or hematospermia after TRUS biopsy (True)	61	76.3%	PSA based prostate screening has high false positive results (True)	49	61.3%
High risk of depression or anxiety after screening (True)	58	72.5%	Overdiagnosis is possible harm of PSA-based screening program (True)	48	60.0%
Risk to develop urinary incontinence , erectile dysfunction or fecal incontinence after therapy (True)	59	73.8%			

Table 3 shows physicians knowledge on prostate cancer risk factors and screening tests , the mean total knowledge score percentage is 52.03 +/- 12.4 (range 26.3-78.9) . Half of the participants 44 (55%) know the recommended age to start screening and only 18 participants (22.5%) know the recommended age to stop screening for prostate cancer.

Majority of the physicians 70 (87.5%) share the decision about prostate cancer screening with their patients , most of them use PSA as screening tool, and aware that it has high false positive results .Only 15 participants (18.8) knows that screening will not affect the mortality rate significantly.

Most of the participants know about prostate cancer diagnostic test, and most of them agree about the possible complications and PC overdiagnosis after the screening.

Majority of the physicians know that increased age (over 50 years) and 1st degree relative with PC are possible risk factors. Most of them think that current smoking ,high fat intake , coffee consumptions and BPH are risk factors for PC, only 30 (37.5%) physicians knows that 1st degree relative with breast cancer increased the risk for PC .

Figure 1 shows physicians perceived practice , only 12.5% of the participants frequently offers screening for asymptomatic patient in the age group 55-69, and 48% would never offer screening.

10% of them would counsel every patient about the possible benefit and harm of screening, while 35% would never counsel before screening.

41% of the physicians would never inform their patient when they order PSA for screening, and 45 % would never discuss PC treatment in general terms.

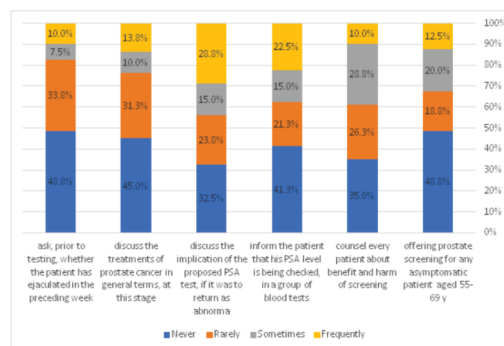


Figure 1: Attitudes toward prostate cancer screening and counseling.

2. Association results:

Factors associated with Knowledge about prostate cancer screening and risk factors

Table4. Independent Samples T-test for knowledge percentage association with participant demographic predictors.

Demographic Factors		N	Mean	SD	p Value
Gender	Female	40	51.97	10.47	0.96
	Male	40	52.11	14.29	
Worked in geriatric clinic	No	60	50.35	11.88	0.035*
	Yes	20	57.11	13.04	
Attended training course in geriatric care in the last 5 years	No	53	50.55	12.57	0.13
	Yes	27	54.97	11.89	
Attended training course in cancer screening the last 5 years	No	58	50.73	11.94	0.126
	Yes	22	55.50	13.37	
Participated in awareness rising events related to prostate cancer	No	69	51.72	11.84	0.56
	Yes	11	54.07	16.32	
Follow up prostate cancer patient	No	68	50.00	11.08	0.01*
	Yes	12	63.60	13.92	
Need for extensive courses about Prostate cancer	No	14	64.66	9.56	0.00*
	Yes	66	49.362	11.3359	
Need for national prostate cancer screening guideline	No	6	60.53	13.62	0.08
	Yes	74	51.35	12.19	
Need for prostate cancer screening decision aid brochure	No	14	56.39	11.94	0.15
	Yes	66	51.12	12.4469	

An independent-sample t-test was conducted to compare participant knowledge score percent with participant demographic factors.

There was a significant difference in the knowledge percent for physicians who have worked in geriatric clinic during their practice (M=57.11, SD=13.04) compare with those who didn't have previous experience (M=50.35, SD=11.88) p Value=0.035.

Also there was a significant difference in the knowledge score percent between the physicians who did follow up prostate cancer patient during their practice (M=63.6, SD=13.92) and those who didn't seen such patient in their clinic (M=49.36, SD=11.08) p Value=0.01 .

Participant who did need extensive courses about prostate cancer have lower knowledge score (M=49.36, SD=11.33) compare with those who didn't need more curses (M=64.66, SD=9.56) p value=0.00 .

Table 5. One way ANOVA test for association between participant Qualifications and knowledge percentage.

Job description	N	Mean	SD	p Value
FM specialist/ consultant	16	60.86	10.87	0.005
FM resident	34	49.85	12.17	
GP	30	49.82	11.79	

A one-way Anova test was conducted to compare the effect of participant job on their knowledge score percentage.

FM specialist/consultant have significantly higher knowledge score (M=60.86, SD=10.87) than FM resident and GP p value= 0.005 .

Table 6. Correlation between age, experience and number of patients with knowledge percentage.

Factors	Range	Pearson Correlation	p Value
Age	(25-59)	0.27	0.015
Years of experience	(1-27)	0.28	0.011
Average patient seen daily	(3-80)	0.01	0.96

A Pearson correlation was computed to assess the relationship between the knowledge score and the age, years of experience and average number of patient seen daily.

There was significant positive correlation between the age of participant ($p=0.015$) and years of experience ($p=0.011$) with the knowledge score percentage, participant with long experience have higher knowledge score.

Factors associated with perceived practice "Screening"

Table 7. Chi Square test of demographic predictors and physician's perceived practice "Screening".

Demo graphic Factors		Screening for any asypmomatic patient in the age group 55-69				p Value
		No		Yes		
		N	Row N %	N	Row N%	
Gender	Female	21	52.5%	19	47.5%	0.502
	Male	18	45.0%	22	55.0%	
Job title	FM specialist/ consultant	8	50.0%	8	50.0%	0.445
	FM resident	19	55.9%	15	44.1%	
	GP	12	40.0%	18	60.0%	
Worked in geriatric clinic	Yes	13	65.0%	7	35.0%	0.093
	No	26	43.3%	34	56.7%	
Attended training course in cancer screening the last 5 years	Yes	16	72.7%	6	27.3%	.008*
	No	23	39.7%	35	60.3%	
Attended training course in geriatric care in the last 5 years	Yes	16	59.3%	11	40.7%	0.180
	No	23	43.4%	30	56.6%	
Participated in awareness rising events related to prostate cancer	Yes	5	45.5%	6	54.5%	0.814
	No	34	49.3%	35	50.7%	
Follow up prostate cancer patient	Yes	4	33.3%	8	66.7%	0.247
	No	35	51.5%	33	48.5%	
Need for prostate cancer screening decision aid brochure	Yes	28	42.4%	38	57.6%	.014*
	No	11	78.6%	3	21.4%	
Need for national prostate cancer screening guideline	Yes	29	43.9%	37	56.1%	0.062
	No	10	71.4%	4	28.6%	
Need for prostate cancer screening decision aid brochure	Yes	34	45.9%	40	54.1%	0.078
	No	5	83.3%	1	16.7%	

A Pearson Chi-square test was calculated to compare the frequency of multiple demographic factors in physicians who screen asymptomatic men for prostate cancer in age group 55-69. Attending training courses in cancer screening significantly affect the decision for screening asymptomatic men in age group 55-69 p value=0.008. Physicians who attend training course in cancer screening during the last 5 years are less likely to screen (72.7%) compare with those who didn't attend training courses (60.3%).

Physicians who need decision aid brochure for prostate cancer screening in their clinic (57.6%) reported more screen compare with those who didn't need (21.4%) p value=0.014.

Table 8. Independent sample T-test for association between demographic predictors and the physician's perceived practice "screening"

	Screening for any asymptomatic patient in the age group 55-69	N	Mean	Std. Deviation	p Value
62	International Journal of Scientific Research				

Age	Yes	41	36.02	9.546	0.014
	No	39	31.54	5.999	
Years of experience	Yes	41	8.93	8.039	0.031
	No	39	5.62	5.143	
Average number of patients seen daily	Yes	41	30.20	15.829	0.001
	No	39	18.59	13.178	

An independent-sample t-test was conducted to compare participant's mean age, experience, and number of patients seen among those who reported screening for any asymptomatic patient in the age group 55-69.

Reported screening of any asymptomatic patient in the age group 55-69 is found to be significantly associated with older age physicians, those have longer experience and those who see more patients (p -0.01, 0.03, and 0.001)

Table 9. Logistic regression analysis:

Factors associated with physician's perceived practice for screening patient

Factors	p Value	OR	95% C.I. for EXP(B)	
			Lower	Upper
Age	0.409	1.15	0.825	1.603
Gender	0.948	0.962	0.300	3.085
Job title	0.198	0.422	0.114	1.570
Experience	0.479	0.862	0.571	1.301
Worked in geriatric clinic	0.605	1.844	0.182	18.707
Average number of patient seen daily	0.028	1.079	1.008	1.155
Attended training course in cancer screening the last 5 years	0.042	5.054	1.062	24.060
Attended training course in geriatric care in the last 5 years	0.913	1.087	0.240	4.930
Participated in awareness rising events related to prostate cancer	0.833	0.837	0.159	4.394
Follow up prostate cancer patient	0.412	0.440	0.062	3.128
Need for prostate cancer screening decision aid brochure	0.429	0.518	0.102	2.643
Need for extensive courses about Prostate cancer	0.219	0.330	0.056	1.931
Need for national prostate cancer screening guideline	0.429	0.337	0.023	5.009

Binary Logistic regression analysis was conducted to determine the independent effect of the demographic factors on the physicians perceived practice "screening"

Average number of patients seen daily is a significant factor for screening, Increase by one patient seen will result in 7.9% increase in practicing prostate cancer screening. OR 1.079 (95% CI 1.008 to 1.155) p value 0.028

Attending training courses in cancer screening in the last five years was a major predictor for prostate cancer screening, the odds of practicing prostate cancer screening is 5 times higher for those who did not attend the training course. OR 5.054 (95% CI 1.062 to 24.06) p value 0.042.

Factors associated with perceived practice "counselling"

Table 10. Independent sample T-test for association between demographic predictors and their physician's perceived practice "counselling"

Counsel every patient about the possible benefit and harm of	N	Mean	Std. Deviation	p Value
Age ?	Yes	52	35.19	0.024
	No	28	31.32	
How long have you been in practice ?	Yes	52	8.15	0.098
	No	28	5.75	
How many patient do you see each day in average ?	Yes	52	26.10	0.227
	No	28	21.64	

Reported counselling of patient about the possible benefits and harm of screening is found to be significantly associated with older age physicians (p -0.024).

DISCUSSION

Physician's knowledge of prostate cancer screening and risk factors.

Knowledge is an important factor in practice, physicians' practice is influenced by their own knowledge and believes about the benefits of screening.

In practice, guidelines are often not followed; one major cause is physicians' lack of knowledge about the recommendations. (24) In this study Physician knowledge and awareness about prostate cancer screening was inadequate for proper counseling and screening.

The USPSTF recommended screening for men aged 55-69 years, but against screening men over 70 years old".

Among surveyed physicians in this study who offer to screen, more than half of them know the recommended age to start screening (55%), and less than quarter (22.5%) of the respondent physicians know recommended age to stop screening. Significant proportion of the respondent physicians are offering screening outside the recommended age (42.5%), 12.5% and 30% would test men younger than 55 years and older than 69 years, respectively. This result is better than Drummond et al study in Ireland 2009 where two thirds of GPs (65%) would test asymptomatic men outside the recommended age ranges; 34% and 51% would test men younger than 50 years and older than 75 years, respectively (20). Previous study done by Christopher B. Allard et al in Canada 2012 showed that more than 42 % of the physicians continue to screen beyond the age of 70. (21) Screening outside the recommended age group might lead to overdiagnosis of PC and an increase in potential screening complications.

The majority (78.8%) of the respondent physicians chose PSA as screening tool. This is similar to Drummond F study where more than three-quarters of respondents (79%) reported that they would usually use PSA to test asymptomatic men for prostate cancer (20), and slightly lower than Christopher B. Allard et a study where (88.1%) of the physicians would chose PSA for screening (80.97% for DRE and PSA, and 7.15% for PSA only) (21).

There is high number of physicians are not aware about the predictivity of PSA as screening tool. About two thirds (61.3%) agree that PSA based prostate screening has high false-positive results. This results is higher than Study done in United States where more than one third (39%) of the physicians know that serum PSA possesses a high sensitivity and a low specificity in detecting prostate cancer (25). Unaware physicians might screen excessively which leads to high false-positive PSA results and an increase in referred cases and overdiagnosis.

A majority of the respondents correctly answered the first-degree relative with a history of prostate cancer (85%) and increased age over 50 years (90%) as risk factors for prostate cancer. However, only (37.5%) of the respondents were aware of the family history of breast cancer in a first-degree relative as a risk factor for prostate cancer. These findings are slightly better than the previous study carried out in Malaysia where more than one third of the GPs (31.1%) were aware of a family history of breast cancer in a first-degree relative as a risk factor (23). Where in Ireland only 18% are aware of it (20). This could be due to the perception that prostate cancer is a male disease and hence doctors may not link it to breast cancer. (23)

Experience showed to be a significant factor in increasing knowledge about prostate cancer, a participant with long experience have higher knowledge score ($p=0.011$). Family medicine specialist/consultant have significantly higher knowledge score than Family medicine resident or general practitioner (p value= 0.005) which is expected.

This result is similar to Bell et al study, knowledge scale scores were higher, on average, among participants who were board-certified Family physicians (7.8 vs 5.0, $P=.002$), and who were within 20 years of medical school graduation (8.1 vs 6.6, $P=.008$). (26)

Physicians who worked in the geriatric clinic have a higher knowledge score percentage than those who didn't (p Value= 0.035) also physicians who follow prostate cancer patients during their practice have significantly higher knowledge score percentage than those who didn't (p Value= 0.01).

Physician's practice of prostate cancer screening and counseling

More than half of the participants physicians (52%) frequently offers to screen for asymptomatic patient in the age group 55-69. This low rate of screening is similar to the study carried out in Malaysia where 49.5% of the surveyed GP screened asymptomatic men for prostate cancer (23). Low screening rate probably due to lake of knowledge or the fact that national guideline is not available in both countries. A study done in Canada showed that 87% of the GPs would screen asymptomatic men for prostate cancer (27). This high number due to availability of local guidelines which recommended GPs to offer prostate cancer screening after discussing the risks and benefits with the patients.

In this study reported screening of an asymptomatic patient in the age group 55-69 is found to be significantly associated with older age physicians, those have longer experience and those who see more patients ($p=0.01$, 0.03, and 0.001) this is similar findings to Drummond et al study which showed that GP older than 50 years, or in practice more than ten years were significantly more likely to usually test asymptomatic men ($p=0.002$, and 0.001) (20). In Tun Firzara and Chirk Jenn study, the factors associated with the propensity of GPs to screen asymptomatic men for prostate cancer were physicians old age group ($p=0.02$) and longer duration of practice ($p=0.03$). (23)

Any survival benefit from prostate cancer screening must be weighed against the potential harms, including anxiety, complications from a prostate biopsy and treatment morbidity (28). Of the surveyed physicians, only 10% would counsel every patient about the potential benefit and harm of screening, while 35% would never counsel before the screening. Also in this study 32.5% of physicians would not routinely discuss the implications of an abnormal PSA test and 45 % would never discuss PC treatment in general terms, this is similar to the study done in Malaysia where 39% of GPs would not routinely discuss the implications of an abnormal PSA test and treatments of prostate cancer before PSA testing. The reasons for physicians not disclosing and discussing the pros and cons of prostate cancer screening with men could be due to the lack of knowledge or communication skills. (29)

41% of the physicians would never inform their patient when they order PSA for screening, while in Malaysia up to a quarter of GPs would not routinely disclose to their patient that his PSA was being checked (23); in contrast, only 10% of the GPs from Ireland would do so (20).

By using binary Logistic regression analysis, the average number of patients seen daily is a significant factor for screening. Increase by one patient seen will result in a 7.9% increase in practicing prostate cancer screening. OR 1.079 (95% CI 1.008 to 1.155) p -value 0.028. Possible explanation would be that the chance of seeing patient who required screening is increasing with an increase in patient number.

Physicians who Attend training courses in the last five years was a major predictor for prostate cancer screening. The odds of practicing prostate cancer screening is 5 times higher for those who did not attend the training course. OR 5.0.54 (95% CI 1.062 to 24.06) p -value 0.042. Attending training courses in cancer screening increase physicians awareness about the screening tools, indications and the potential benefits or harm from screening which might decrease the rate of screening or overdiagnosis.

CONCLUSION

Our findings suggest that PHC physicians should be aware about the recent recommendations. The need for national PC screening guideline is essential. PHC physicians should attend cancer screening course or have post graduate qualifications to be aware about the recent recommendations. Also, they should work in geriatric clinic or urology clinic during their undergraduate or postgraduate training to increase their knowledge

REFERENCES

1. National Cancer Institute. SEER Cancer Statistics Factsheets: prostate cancer. <https://seer.cancer.gov/statfacts/html/prost.html>. Accessed July 24, 2017.
2. Mettlin C, Jones G, Averette H, Gusberg S, Murphy G. Defining and updating the American Cancer Society guidelines for the cancer-related checkup: prostate and endometrial cancers. *CA: A Cancer Journal for Clinicians*. 1993;43(1):42-46.
3. LAG, Eisner, MP, Kosary, CL, et al. SEER Cancer Statistics Review, 1973-1999, National Cancer Institute, Bethesda, MD 2002.
4. Lu-Yao G, Friedman M, Yao S. Use of Radical Prostatectomy Among Medicare Beneficiaries Before and After the Introduction of Prostate Specific Antigen Testing. *The Journal of Urology*. 1997;157(6):2219-2222.
5. Al-Shahrani Z, Al-Rawaji A, Al-Madoui AN, Hayder MS. Cancer incidence report,

- Saudi Arabia 2014. Riyadh (KSA): Saudi Health Council, Saudi Cancer Registry; 2014.
6. Schröder F, Hugosson J, Roobol M, Tammela T, Zappa M, Nelen V et al. Screening and prostate cancer mortality: results of the European Randomised Study of Screening for Prostate Cancer (ERSPC) at 13 years of follow-up. *The Lancet*. 2014;384(9959):2027-2035.
 7. Andriole G, Crawford E, Grubb R, Buys S, Chia D, Church T et al. Prostate Cancer Screening in the Randomized Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial: Mortality Results after 13 Years of Follow-up. *JNCI Journal of the National Cancer Institute*. 2012;104(2):125-132.
 8. Grossman D, Curry S, Owens D, Bibbins-Domingo K, Caughey A, Davidson K et al. Screening for Prostate Cancer. *JAMA*. 2018;319(18):1901.
 9. Qaseem A, Barry M, Denberg T, Owens D, Shekelle P. Screening for Prostate Cancer: A Guidance Statement From the Clinical Guidelines Committee of the American College of Physicians. *Annals of Internal Medicine*. 2013;158(10):761.
 10. Wolf A, Wender R, Etzioni R, Thompson I, D'Amico A, Volk R et al. American Cancer Society Guideline for the Early Detection of Prostate Cancer: Update 2010. *CA: A Cancer Journal for Clinicians*. 2010;60(2):70-98.
 11. Canadian Task Force on Preventive Health Care | Prostate Cancer (2014) [Internet]. *Canadiantaskforce.ca*. 2018 [cited 5 November 2018]. Available from: <https://canadiantaskforce.ca/guidelines/published-guidelines/prostate-cancer/>
 12. American Urological Association - [Internet]. *Auanet.org*. 2018 [cited 5 November 2018]. Available from: [https://www.auanet.org/guidelines/prostate-cancer-early-detection-\(2013-reviewed-for-currency-2018\)](https://www.auanet.org/guidelines/prostate-cancer-early-detection-(2013-reviewed-for-currency-2018))
 13. Kilpeläinen T, Tammela T, Roobol M, Hugosson J, Ciatto S, Nelen V et al. False-positive screening results in the European randomized study of screening for prostate cancer. *European Journal of Cancer*. 2011;47(18):2698-2705.
 14. Draisma G, Etzioni R, Tsodikov A, Mariotto A, Wever E, Gulati R et al. Lead Time and Overdiagnosis in Prostate-Specific Antigen Screening: Importance of Methods and Context. *JNCI Journal of the National Cancer Institute*. 2009;101(6):374-383.
 15. Rosario D, Lane J, Metcalfe C, Donovan J, Doble A, Goodwin L et al. Short term outcomes of prostate biopsy in men tested for cancer by prostate specific antigen: prospective evaluation within ProtecT study. *BMJ*. 2012;344(jan09 1):d7894-d7894.
 16. Raaijmakers R, Kirkels W, Roobol M, Wildhagen M, Schröder F. Complication rates and risk factors of 5802 transrectal ultrasound-guided sextant biopsies of the prostate within a population-based screening program. *Urology*. 2002;60(5):826-830.
 17. Walter L, Fung K, Kirby K, Shi Y, Espaldon R, O'Brien S et al. Five-Year Downstream Outcomes Following Prostate-Specific Antigen Screening in Older Men. *JAMA Internal Medicine*. 2013;173(10):866.
 18. Fenton J, Weyrich M, Durbin S, Liu Y, Bang H, Melnikow J. Prostate-Specific Antigen-Based Screening for Prostate Cancer. *JAMA*. 2018;319(18):1914.
 19. Rabah D, Arafa M. Determinants of primary care physicians' practice of prostate cancer counseling and screening. *Health*. 2010;02(11):1312-1315.
 20. Drummond F, Carsin A, Sharp L, Comber H. Factors prompting PSA-testing of asymptomatic men in a country with no guidelines: a national survey of general practitioners. *BMC Family Practice*. 2009;10(1).
 21. Allard CB, Dason S, Lusic J, Kapoor A. Prostate cancer screening: Attitudes and practices of family physicians in Ontario. *Canadian Urological Association Journal*. 2012 Jun;6(3):188.
 22. Akerman JP, Allard CB, Tajzler C, Kapoor A. Prostate cancer screening among family physicians in Ontario: An update on attitudes and current practice. *Canadian Urological Association Journal*. 2018 Feb;12(2):E53.
 23. Tun Firzara A, Ng C. Knowledge and practice of prostate cancer screening among general practitioners in Malaysia: a cross-sectional study. *BMJ Open*. 2016; 6(9): e011467.
 24. Cabana MD, Rand CS, Powe NR, et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA*. 1999;282:1458-65.
 25. Pendleton, J., Curry, R. W., Kaserian, A. I. I., Chang, M., Anai, S., Nakamura, K., Rosser, C. J. (2008). Knowledge and Attitudes of Primary Care Physicians Regarding Prostate Cancer Screening. *Journal of the National Medical Association*, 100(6), 666-673.
 26. Bell, D. S., Hays, R. D., Hoffman, J. R., Day, F. C., Higa, J. K., & Wilkes, M. S. (2006). A test of knowledge about prostate cancer screening. *Journal of General Internal Medicine*, 21(4), 310-314.
 27. Curran, V., Solberg, S., Mathews, M., Church, J., Buehler, S., Wells, J., & Lopez, T. (2005). Prostate Cancer Screening Attitudes and Continuing Education Needs of Primary Care Physicians. *Journal of Cancer Education*, 20(3), 162-166. *J Cancer Educ* 2005;20:162-6.
 28. Litwin, M. S. (1995). Quality-of-life outcomes in men treated for localized prostate cancer. *JAMA: The Journal of the American Medical Association*, 273(2), 129-135.
 29. Davis K, Haisfield L, Dorfman C, et al. Physicians' attitudes about shared decision-making for prostate cancer screening. *Fam Med* 2011;43:260-6.