International Journal of Advanced Community Medicine

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Knowledge, attitude, and practice towards patient safety culture among primary health care physicians in training centers at cluster one in Riyadh, Kingdom of Saudi Arabia

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Abstract
Background: Patient safety is a global concern among healthcare providers. However, the challenges to and the future of patient safety have not been explored in details at primary health care centers in recent literature in the Kingdom of Saudi Arabia. The World Health Organization (WHO) defines patient safety as "the prevention of errors and adverse effects to patients associated with health care" and "to do no harm to patients". The study aims to identify and analyze factors that influence patient safety culture in the primary health care setting.
Methodology: A cross-sectional study was conducted on primary health care physicians working in 12 primary health care training centers, cluster one, ministry of health, Riyadh city, Kingdom of Saudi Arabia, over a period of two months from the beginning of January, 2021 to the end of February, 2021 using a survey inspired from Hospital Survey on Patient Safety Culture (HSOPS). The HSOPS was developed by the Agency for Healthcare Research and Quality (AHRQ) in 2004 and has been translated into around 20 different languages. The questionnaire was answered by all primary health care physicians who accepted to be included in this study. The data was analyzed by Statistical Package for the Social Sciences (SPSS) latest version program.
Results: In this study, the response rate was 94.55% and we were able to collect 208 responses of our questionnaire among primary health care physicians with 75% of the physicians were Saudis. 53.4% of the responders were males. The overall average positive response rate for the patient safety culture dimensions was 76.13%. Moreover, we found that 48.1% of the participants rated the procedures to achieve patients' safety is very good while 32.2% of them reported excellent patients' safety. Moreover, we found that almost half of the physicians (46.2%) reported no event reports in the last 12 months while 28.8% reported 1-2 events, 20.2% reported 3-5 events and only 1% reported 11-20 event in the last 12 months.
Conclusion: The patient safety culture in primary health care facilities in Riyadh city, Kingdom of Saudi Arabia is good and gives better results than previous studies.

Keywords: Patient safety culture, Patient safety, medical errors, primary health care

Introduction
Patient safety is a global concern among healthcare providers. However, the challenges to and the future of patient safety have not been explored in details at primary health care centers in recent literature in the Kingdom of Saudi Arabia. The World Health Organization (WHO) defines patient safety as "the prevention of errors and adverse effects to patients associated with health care" and "to do no harm to patients" [1]. Patient safety is also defined as 'The prevention of harm to patients caused by errors of commission or omission' [2]. Safety culture' refers to the 'shared values, attitudes, perceptions, competencies and patterns of behavior [3]. Achieving a culture of safety requires an understanding of the values, attitudes, beliefs and norms that are important to health care organization and what attitudes and behaviors are appropriate and expected for patient safety [4].

In recent years some of the primary health care centers in Kingdom of Saudi Arabia have been accredited by Saudi central board for accreditation of healthcare institutions (CBAHI). And some were accredited by Joint Commission International (JCI).

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In 2012, the WHO established a group to study the issues involved in patient safety in primary care [5], the aim of which is to expand knowledge on risks to patients in primary care and the magnitude and nature of adverse events due to unsafe practices. Primary healthcare facilities provide basic preventive and curative care and are thereby considered to be the cornerstone of healthcare in the Kingdom of Saudi Arabia. With more than 2,000 primary healthcare centers in the Kingdom, improving performance standards and establishing safety guidelines is a high priority for CBAHI [6]. Addressing this need, action committees collaborated with relevant authorities to develop a draft of the National Standards for Primary Healthcare Centers. Field studies were then conducted to ensure the suitability of the standards. As a result, a revision was issued to accommodate current conditions. Research done in New Zealand to formulate a tool to assess the patient safety culture in general practice using (MaPSaF) concluded that the framework can be adapted and used in practices to stimulate learning about safety culture and to facilitate team communication [7]. A questionnaire–based survey was conducted in Muscat, Oman using a validated Hospital Survey of Patient Safety Culture tool concluded that the results of this study will provide policy makers and health care professionals with a detailed understanding of the current patient safety culture in primary care in Muscat, Oman. The results will be used by the Ministry of Health to inform policy and strategies to strengthen patient safety within primary health care in Oman [8].

A descriptive cross-sectional study done in four primary healthcare centers in Kuwait using a self-administered "hospital survey on Patient safety culture" adopted questionnaire. The result that found it is not as strong as improvements for the provision of safe health care and they suggest that to be a well-designed patient safety initiative are needed to be integrated with organizational policies [9]. A Systematic Review done between 1 January 1980 and 31 July 2014 in 18 databases to investigate how often patient safety incidents occur in primary care and how often these were associated with patient harm. The results were found that, the studies reported between <1 and 24 patient safety incidents per 100 consultations. The median from population-based record review studies was 2-3 incidents for every 100 consultations/records reviewed. It was estimated that around 4% of these incidents may be associated with severe harm, defined as significantly impacting on a patient's well-being, including long-term physical or psychological issues or death (range <1% to 44% of incidents). Incidents relating to diagnosis and prescribing were most likely to result in severe harm [10].

Methodology
1. Study design, Setting and time frame
A cross-sectional study was conducted on primary health care physicians working in 12 primary health care training centers, cluster one, ministry of health, Riyadh city, Kingdom of Saudi Arabia two months from the beginning of January, 2021 to the end of February, 2021.

2. Sampling method and participants
All primary health care physicians in training centers, at cluster one, in Riyadh city, Kingdom of Saudi Arabia were included. In this study, the inclusion criteria include all primary health care physicians (all family medicine consultants, all family medicine specialists, all family medicine training residents, and all general practitioners) who are currently working in the primary health care training centers and agreed to participate within the study period. The exclusion criteria, includes physicians who were not willing to participate in the study, other specialty physicians within the study period working in the primary health care centers. The sample size is 220 physicians, which includes all family medicine consultants, all family medicine specialists, all family medicine training residents and all general practitioners.

3. Study tool
The current study used a validated self-administered questionnaire, the Hospital Survey on Patient Safety Culture (HSOPSC) developed by the Agency of healthcare Research (AHRQ) was used to assess the current patient safety culture among healthcare professionals in primary care [11]. The HSOPSC has been used in studies from the USA, UK and Europe in the hospital setting [12, 13]. It has also been used in the hospital setting in in the Middle East including Kuwait [9]. It has been adapted and validated for primary care use in Portugal [14] and Switzerland [15]. It is a valid and a reliable tool developed on the basis of previous literature, cognitive tests and factor analysis. Safety culture variations have been reported across healthcare facilities, departments and occupational categories of healthcare workers in North America, Europe, Asia, and the Middle East [16]. The instrument includes 42 items

grouped into 12 composite measures. It includes also two questions that ask respondents to provide an overall grade on patient safety for their work and to indicate the number of events they reported over the past 12 months. The scale used is a five-point Likert scale which ranges from 'Strongly disagree' to 'Strongly agree', or from 'Never' to 'Always' when relevant. A global safety grade between 'poor' and 'excellent' and the numbers of reported incidents in the past 12 months were also assessed. The questionnaire was not translated into Arabic because all health professionals speak English.

4. Statistical Analyses
Data was coded, tabulated and analyzed using Statistical Package for the Social Sciences (SPSS) latest version. Descriptive statistics were applied to present demographic variables. Pearson's correlation coefficient analysis was used to explore the association between dependent and independent variables. Multiple regression analysis was used to examine the influence of independent variables on dependent variables. Qualitative data was expressed as numbers and percentages, and a p-value of <0.05 would be considered as statistically significant.

5. Ethical considerations
The cover letter requesting for voluntary participation from all physicians enrolled in this study. The researchers ensured anonymity of identities of participants, confidentiality of responses, and possible publication of the study was provided to the participants. The participants were not provided with any form of compensation in their participation in this study.

**Table 1:** Demographic factors of participants (N=208)

		Count	Column N%
Name of PHC:	Al Moraba	15	7.2%
	Al Azziziyah	39	18.8%
	Al Mansoura	9	4.3%
	Otiga	16	7.7%
	Al Khaldiyah	12	5.8%
	Al Zahra	9	4.3%
	Dhart Namar	20	9.6%
	Al Moraba	10	4.8%
	Twaiq West	24	11.5%
	Laban	23	11.1%
	Al Malaz	20	9.6%
	Shubra	11	5.3%
Nationality:	Saudi Arabian	156	75.0%
	Non-Saudi Arabian	52	25.0%
Gender:	Male	111	53.4%
	Female	97	46.6%
Age:	20 - 30 years.	113	54.3%
	31 - 40 years	66	31.7%
	41 - 50 years.	23	11.1%
	51 - 60 years.	5	2.4%
	More than 60 years.	1	0.5%
Your Current Position:	Consultant	18	8.7%
	Senior Registrar	1	0.5%
	Registrar	1	0.5%
	Specialist	18	8.7%
	General practitioner.	30	14.6%
	Resident.	140	67.0%

Results

In this study, the response rate was 94.55% and we were able to collect 208 responses of our questionnaire among primary health care physicians from 12 PHC centers including Al Azziziyah center (18.8%), Twaiq west center (11.5%) and Laban (11.1%). Among the participants, 75% of physicians were Saudi Arabian and 53.4% were males. Considering the age of the participants, we found that 54.3% of the participants were aged between 20-30 years old while 31.7% were between 31-40 years old and only 0.5% were older than 60 years old. Moreover, 67% of the physicians reported that they were residents at the time of the study, 14.6% were general practitioners and 8.7% were consultants (Table 1).

Furthermore, we found that 60.6% of participants had experience of 1-5 years in the current position while 21.6% had 6-10 years of experience and only 2.4% had experience more than 20 years in the same position (Figure 1).
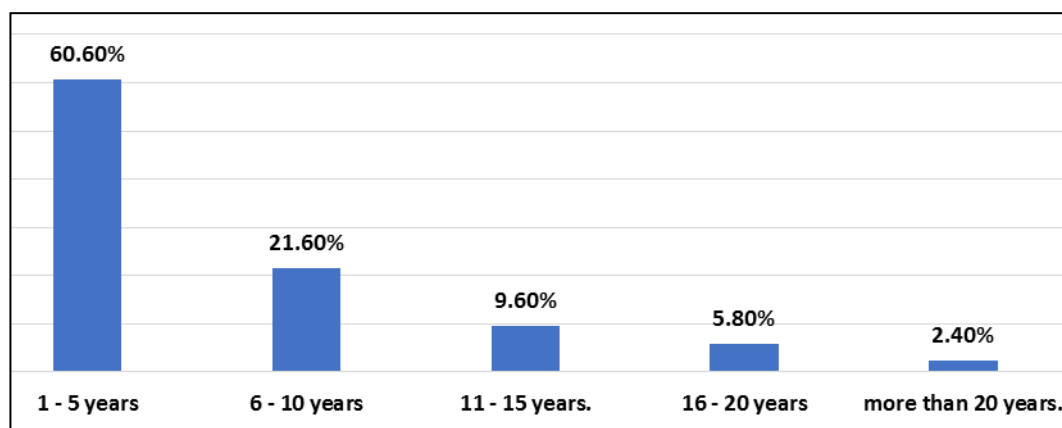
Fig 1: Years of experience in physicians' current Position

Considering perception of the participants towards their work area, we found that 88.0% of the participants agree that people in their PHC support each other while 82.2% agreed that positive changes were happened when things went wrong. The participants continued their positive attitude toward their work area as 91.8% of them did not think that serious errors did not happen by chance and 71.6% agreed that people helped each other well. However, 34.1% of participants reported that staff may be afraid that errors they make are kept in their personnel file however, 94.7% of them did not think that patient's safety would sacrifice them to work and 98.1% of them reported that they evaluate the effectiveness of patient's safety and 95.2% thought that the procedures in their PHC are good in preventing errors from happening (Table 2).

**Table 2:** The participants' perception towards their work area

	Mean	Disagree/Strongly disagree	Neutral	Agree/ Strongly agree
1. People support one another in this PHC, and treat each other with respect.	4.28	2.4%	9.6%	88.0%
2. When things go wrong, this usually leads to positive changes in my practice.	4.13	3.8%	13.9%	82.2%
3. It is just by chance that more serious errors don't happen around here.	1.81	91.8%	7.7%	0.5%
4. When one area in this PHC gets really busy, others help out.	3.79	10.6%	17.8%	71.6%
5. When an event is reported, it feels like the person is being written up, not the problem, and staff worry that errors they make are kept in their personnel file.	2.90	42.8%	23.1%	34.1%
6. After we make changes to improve patient safety, we evaluate their effectiveness, so we are actively doing things to improve patient safety.	4.35	1.9%	0.0%	98.1%
7. Patient safety is never sacrificed to get more work done.	4.62	1.0%	4.3%	94.7%
8. Our procedures and systems are good at preventing errors from happening.	4.19	3.4%	1.4%	95.2%

Moreover, considering participants' perception toward their supervisors, most of them thought that their supervisor says good word when work done according to patients' safety procedures (93.3%), seriously considers staff suggestion (99%) and overlooks patients safety problems (98.1%). Considering their perception toward communications, 73.1% of the participants would always give feedback about changes put into place based on event reports, and they are informed about errors that happen in this area while 76.4%

would always freely speak up when they see something wrong, and 88.1% would always discuss ways to prevent errors from happening again. Regarding the frequency of events reported, 68.8% of the participants stated that is always errors to report even if it is caught and corrected before affecting patients while 58.7% of the participants were always to report events when considering errors which harm the patients (Table 3).

Table 3: The participants' perception towards their supervisors, communications and frequency of reported errors

	Mean	Disagree / Never	Neutral	Agree / Always
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.	4.28	1.0%	5.8%	93.3%
2. My supervisor/manager seriously considers staff suggestions for improving patient safety.	4.44	0.0%	1.0%	99.0%
3. My supervisor/manager overlooks patient safety problems that happen over and over.	4.33	1.4%	0.5%	98.1%
1. We are given feedback about changes put into place based on event reports, and we are informed about errors that happen in this area.	3.79	0.5%	26.4%	73.1%
2. Staff will freely speak up if they see something that may negatively affect patient care.	4.08	1.4%	20.2%	76.4%
3. In this PHC, we discuss ways to prevent errors from happening again.	4.25	1.0%	11.1%	88.0%
1. When an error is made, but is caught and corrected before affecting the patient, how often is this reported?	3.68	6.3%	25.0%	68.8%
2. When an error is made that could harm the patient, but does not, how often is this reported?	3.52	9.6%	31.7%	58.7%
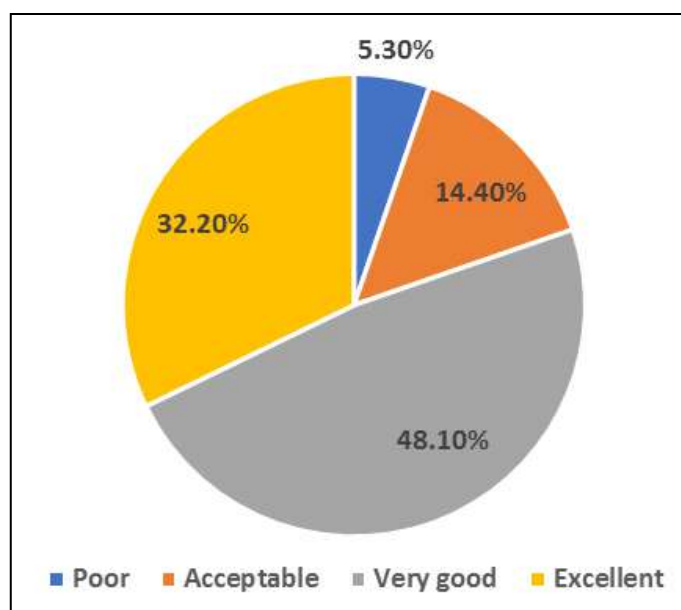
Fig 2: Overall grade on patient safety

Moreover, we found that 48.1% of the participants rated the procedures to achieve patients' safety is very good while 32.2% of them reported excellent patients' safety, 14.4% thought that it is acceptable and 5.3% reported poor

patients' safety (Figure 2).
Furthermore, we found that 96.6% of the participants thought that PHC management provided a work climate that promotes patients safety while 89.9% of them did not think

that PHC units do not coordinate well and 29.3% of them thought that problem often occur in the exchange of information across PHC units. Moreover, 99.5% of the participants did not agree that PHC management seems interested in patient safety only after an adverse event happens (Table 4).

Table 4: The participants' perception towards their PHC in patient safety culture

|	Mean	Disagree / Strongly disagree	Neutral	Agree / Strongly agree
1. PHC management provides a work climate that promotes patient safety.	4.30	0.5%	2.9%	96.6%
2. PHC units do not coordinate well with each other.	1.86	89.9%	9.6%	0.5%
3. Problems often occur in the exchange of information across PHC units.	2.77	48.6%	22.1%	29.3%
4. The actions of PHC management show that patient safety is a top priority.	4.80	0.0%	0.0%	100.0%
5. PHC management seems interested in patient safety only after an adverse event happens.	1.42	99.5%	0.0%	0.5%
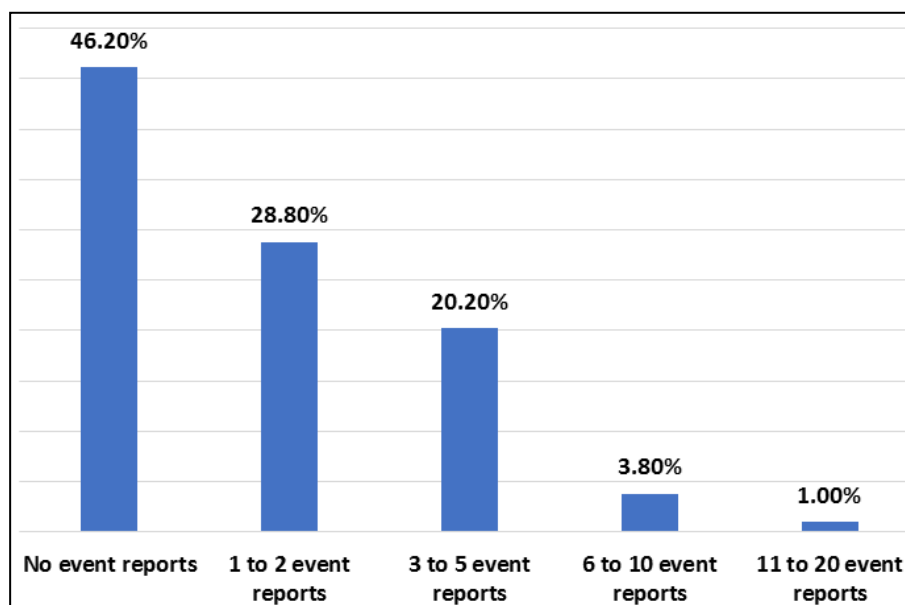
Fig 3: In the past 12 months, how many event reports have you filled out and submitted?

Moreover, we found that almost half of the physicians (46.2%) reported no event reports in the last 12 months while 28.8% reported 1 -2 events, 20.2% reported 3-5 events and only 1% reported 11-20 event in the last 12 months (Figure 3).

In table 5, we discussed the relationship between demographic factors, incidence of error reports and the participants' percentage of positive attitude towards PHC process of controlling patients' safety. We found that non-Saudi Arabian physicians reported more negatively positive perception towards the supervisor or manager practice toward patients' safety rather than Saudi Arabian one (94.23% vs. 97.65%, P=0.03). Moreover, we did not find any significant difference considering perception of the process and age of the physicians nor their position. Considering gender, we found that females significantly reported more negative perception towards their work area (47.79% vs 50.57%, p=0.045). Considering the rate of reporting events, we found that the rate was significantly higher among participants who reported more negatively communication reports, frequency of events before and after events and generally PHC procedures (Table 5).

Table 5: The relation between demographic factors, incidence of error reports and the participants' percentage of positive attitude toward PHC process of controlling patients' safety.

		Your Work Area	Your Supervisor / Manager	Communications	Frequency of Events Reported	Your PHC
Nationality	Saudi Arabian	49.36	97.65	86.32	66.67	87.44
	Non-Saudi Arabian	49.04	94.23	76.92	54.81	85.38
	P-value	0.840	0.03*	0.085	0.171	0.33
Age:	20 - 30 years.	48.56	97.64	87.91	70.35	86.73
	31 - 40 years	50.76	97.47	81.31	59.09	87.88
	41 - 50 years.	47.83	91.30	75.36	50.00	87.83
	51 - 60 years.	50.00	93.33	66.67	40.00	76.00
	More than 60 years.	62.50	100.00	100.00	50.00	80.00
	P-value	0.358	0.059	0.115	0.546	0.378
Gender:	Male	50.57	97.27	84.85	60.00	87.27
	Female	47.79	96.18	83.33	68.75	86.46
	P-value	0.045*	0.431	0.146	0.801	0.658
Your Current Position:	Consultant	46.53	94.44	75.93	58.33	85.56

	Senior Registrar	37.50	100.00	100.00	100.00	80.00
	Registrar	62.50	100.00	100.00	100.00	100.00
	Specialist	54.17	98.15	88.89	47.22	86.67
	General practitioner.	47.08	94.44	76.67	61.67	86.67
	Resident.	49.46	97.34	85.51	65.94	87.25
	P-value	0.058	0.601	0.450	0.827	0.909
In the past 12 months, how many event reports have you filled out and submitted?	No event reports	49.74	96.53	89.24	68.23	86.87
	1 to 2 event reports	47.29	96.67	80.56	68.33	87.00
	3 to 5 event reports	49.70	97.62	84.92	57.14	88.10
	6 to 10 event reports	53.13	95.83	54.17	18.75	82.50
	11 to 20 event reports	62.50	100.00	33.33	25.00	80.00
	P-value	0.110	0.957	0.01*	0.043*	0.04*

Discussion and conclusion

Up to our knowledge, this is the first study that aimed to identify and analyze factors that influence patient safety culture in the primary health care setting in Riyadh city, Kingdom of Saudi Arabia. In this study, the overall average positive response rate for the patient safety culture dimensions was 76.13%. This is higher than the reported in many studies which used the same tool including the study of Chen I-C in Taiwan which reported overall average of positive response of 61% [17] as well as study of Akologo et.al in upper region of Ghana who reported overall average of positive responses of 58.1% [4]. In Kuwait, a study conducted by Ghobashi et.al. Showed that overall average of positive response rate for patient safety culture was 82% which is slightly higher than ours results [9]. Moreover, in Turkey, Bodur S, showed that the mean average of positive responses was 50% [18] which is slightly similar to another study conducted by Ayisa A in Ethiopia which found that mean average of positive responses was 45.3% [19] and both results were lower than our average. Similarly other previous studies reported lower overall average of positive responses including 67% in Yemen [20], 62.7% in Sri Lanka [21], 58% in Oman [22], 58% in South India [23]. This difference between studies in reporting the overall mean average of positive responses for the patient safety culture dimensions may be due to the differences in organizational behavior between countries. The high average positive rate reported in our study suggests that healthcare providers in Riyadh city, Kingdom of Saudi Arabia feel quite positive towards patients safety culture in their work areas and suggests that higher administration values, organizational commitment, leadership and relationships inside hospital level were found in the work culture of PHC physicians in in Riyadh city, Kingdom of Saudi Arabia.

Moreover, the overall patient's safety grade was rated as excellent or very good by 80.3% of the physicians in this study (48.1% very good and 32.2% excellent) while only 5.3% reported poor patients' safety. This is lower than reported by the study of Ghobashi who found that 85% of the physicians rated the overall patient's safety grade as excellent or very good [9]. Moreover, this result is comparable with the results of Alahmadi HA, in Kingdom of Saudi Arabia who reported that 85% of the participants (who included nurses, technicians, managers and medical staff) rated the overall patient safety grade as excellent or very good [24]. However, our results were much better than the reported in study of who reported that 29.3% of the physicians rated the overall patients safety grade excellent or very good [19] as well as study in Adds Abba of 35.7% [25], Bale Zone hospitals of Ethiopia of 38.2% [26]. Moreover, we found in this study high rate of positive attitude among participants where 94.7% of participants thought that

patient's safety is never scarified to get more work done and 95.2% claimed that their procedures and systems are good at preventing errors from happening. This is better than the reported in the study of Alahmadi HA who reported that 63% thought that patient's safety is never sacrificed to get more work done and 70% claimed that their procedures and systems are good at preventing errors from happening [24]. The study of Ghobashi reported 69% claimed that patient safety is never sacrificed to get more work done and 67% claimed that their procedures and systems are good at preventing errors from happening [9]. Research has shown that effective error response, with the primary goal of identifying systemic errors rather than placing blame on individuals, is essential for building a positive patient safety culture [6, 27]. It has been recommended that in the event that a medical error eventually occurs, public order should be taken into account and not to put on the person who caused the error [28]. A "flawless" environment in which people can identify and report mistakes without fear is ideal for good patient care [29]. When medical errors are reported, steps can be taken to prevent recurrence.

Considering the rate of reporting patients safety events, we found in our study that 46.2% of the participants reported no event reports in the last 12 months while 28.8% reported 1-2 events, 20.2% reported 3-5 events and only 1% reported 11-20 event in the last 12 months. In a study conducted in Ain-Shams university hospitals in Egypt, the rate of adverse events reporting and recording was 33.4 [30].

Considering factors that affect the physicians' perception about the patient's safety culture, we found that females significantly reported more negative perception towards work area. This is similar to other studies [23, 25]. It could be biological. Women are more sensitive to the well-being of others, and when faced with a stressful situation, they are more likely to respond by reaching out, connecting with others, and seeking protection and care in the community [31]. Moreover, we did not find any significant difference considering perception of the process and age of the physicians nor their position.

This study has some limitations. Generalization of the current study's results is one of the study's limitations as the PHC centers included in the study were selected as a purposive sample. Moreover, the depending on self-reporting questionnaire could lead to some personal bias.

In conclusion, the patient safety culture in primary health care facilities in Riyadh city, Kingdom of Saudi Arabia is good and gives better results than previous studies. Well-designed and systematic patient safety initiatives in primary care must be integrated with organizational policies, especially with the urgent need to address and disclose the vital ethical component of medical errors, open communication and associated emotional issues, investment

in vibrant areas, skilled organizational learning and strong team behavior at work.

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