Original Article

Perception of Physician about Medication Safety in Saudi Arabia

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DOI: 10.47750/pnr.2022.13.S06.159

Abstract

Objective: In this study, we aimed to explore the perception of physician about medication safety in the Kingdom of Saudi Arabia.

Methods: In this cross-sectional survey, we aimed to explore the perception of physician about medication safety in Saudi Arabia. We used a self-reported electronic survey questionnaire and distributed it to physicians, from intern to consultant, and specialists in Saudi Arabia. The survey collected demographic information of the physicians and about the perception of medication safety in medical care. Besides, the perception of barriers prevents off implementation of the medication safety system in medical care. We used 5-point Likert response scale system with close-ended questions to obtain responses. The data were collected through the Survey Monkey system and analyzed with the use of Statistical Package of Social Sciences (SPSS), Jeffery's Amazing Statistics Program (JASP), and Microsoft Excel (version 16) software.

Results: A total of 253 physicians responded to the questionnaire, with the majority of them belonged to the central region 73 (54.07%), with statistically significant difference among the areas ($p<0.01$). Most of the responders were in the age group of 24–35 years 72 (59.02%) with statistically significant differences between all age groups ($p<0.01$). Most of the physicians were General Practitioners 32 (27.59%), residents 31 (26.72%), and specialists 22 (18.97%) with statistically significant differences between all qualification levels ($p<0.05$). The average score of Perception of Physician about Medication Safety was (3.13) with high scores obtained for the element was 'the physician felt the continuing education should include the medication's safety (3.33).' and 'the physicians believed that Medication's wastage services are essential in medical care (3.30).' The average score related to 'perceptions of barriers prevent you from implementing medication safety in medical and surgical care was 3.13. The highest score for the element implemented was a report that would generate extra work (3.34) and an uncertain association between the dental drugs and safety-related issues (3.33) with statistically significant difference between answers ($p<0.05$).

Conclusion: In this study, the Perception of Physician about Medication Safety aspects or obstacles of implementation was found to be inadequate in Saudi Arabia. Therefore, implementing periodic education and training in medication safety in medical care are highly recommended to improve the medication safety aspects in medical care in Saudi Arabia.

Keywords: Medication Safety, Perception, Physicians, Saudi Arabia.

INTRODUCTION

All the healthcare providers should be knowledgeable about and practice medication safety. [1,2]. The good or bad approach of medications safety is determined by their perceptions [3,4]. Moreover, the demand for learning or practicing medications safety due to various barriers may prevent implementation in practice. For example, there was no undergraduate or postgraduate

education and training of medications safety; there was a lack of time or understaffed to implement the medications safety guidelines or the perception of unnecessary medications safety procedures [5]. Several studies have been conducted about the physician or dentist's perception or nurse's perceptions of medication safety [5-11]. Other studies have been about pharmacists' perceptions of adverse drug reaction reporting systems [12]. The authors were not familiar with any investigation about physician's perception of medications safety locally or elsewhere. The current study seeks to identify the physician's perception of drugs safety procedures in the Kingdom of Saudi Arabia.

Methods

This is a descriptive cross-sectional study that explored the physician's perception of medication safety in Saudi Arabia. We used self-reported electronic monkey for survey and distributed it to physicians including all physicians from consultants to interns, physician specialties located in Saudi Arabia. All non- physicians, students and uncompleted surveys were excluded from the study. The survey collected demographic information of the physicians and data regarding the perception of medication safety in medical care. Furthermore, the perception of barriers prevents the medication safety system from being implemented in medical care. We used a 5-point Likert response scale system with closed-ended questions to obtain responses. Based on the previous literature with unlimited population size, the sample for this cross-sectional study was calculated with the following parameters: population percentage of 50%, the confidence level 95%, with a z score of 1.96 and error margin of 5-6.5% and drop-out rate of 10%. Thus, the calculated sample size was around 251 to 432 with a power of study of 80% [13-15]. The response rate required for the calculated sample size was at least 60-70 % [15,16]. The survey was distributed through social media, Telegram app, and via personal communication. A reminder message was sent once every week. The survey data was validated by the expert reviewers and pilot testing. Moreover, the data were analyzed through various reliability test Cronbach alpha, McDonald's ω, Gutmann's λ2, and Gutmann's λ6. The data were collected through the Survey Monkey system. The Statistical Package of Social Sciences (SPSS) and Jeffery's Amazing Statistics Program (JASP), and Microsoft Excel (version 16) software. We performed descriptive and frequency analysis, goodness of fit analysis, correlation analysis, and inferential analysis of factors affecting the physician's perception of medication safety. The STROBE (Strengthening the reporting of observational studies in epidemiology statement: guidelines for reporting observational studies) guided the reporting of the results of this study [17,18].

Ethical Approval

The research protocol was approved by research ethics committee, Pharmacy College, Shaqra University, Saudi Arabia.

Results

A total of 253 physicians responded to the questionnaire. Of them, majority of the responders were from central region 73 (54.07%), with statistically significant differences between the areas ($p<0.01$). Most of the responders belonging to the privates' hospitals 48 (18.97%), Ministry of Health (MOH) hospitals 41 (16.21%), and University hospitals 40 (15.81%). Of the total responders, 72 (60.50%) were female, and 47 (39.50%) were male, and there were statistically significant differences between the genders ($p<0.01$). Most of the responders were in age group of 24–35 years (72 (59.02%)) with statistically significant difference between all age groups ($p<0.01$). Most of the physicians were General Practitioner 32 (27.59%), residents 31 (26.72%), and specialists 22 (18.97%) with statistically significant differences between all positions held($p<0.05$). Most of the responders were holding Physician staff jobs 34 (31.78%) and supervisors 27 (25.23%) with no statistically significant difference between them ($p=0.389$). Most physicians had experience less than one year 26 (23.42%) with no statistically significant difference between all experience levels. Almost one-fifth of the physicians were 23 (20.35%), with statistically significant differences between them ($p=0.025$). (Table 1 and 2). The average score for the element of physician perceptions of medication safety were 3.13. The highest score for the elements "the physician felt the continuing education should include the medication's safety (3.33). The physicians believed that Medication waste services are necessary in medical care (3.30). Alternatively, the lowest score was obtained for the element that "institution, medications safety policy, and procedures must be well implemented (2.84)" and "In-hospital promotes itself as an organization that responds to Medication Errors (MEs) and other safety-related issues (2.94)" with statistically significant difference between the responses ($p<0.05$). All aspect of physician perceptions of medication safety was statistically significant difference between responses ($p<0.05$), except for the "opportunity to discuss and receive feedback about medications safety with other staff ($p=0.248$)", "there should be set guidelines for medication error disclosure in medical care ($p=0.477$)" was non-statistically significant between answers as explored in table 3. The average scores of perceptions of barriers prevent you from implementing medication safety in medical and surgical care (3.13). The highest score element was Concern that a report will generate extra work (3.34) and an Uncertain association between the dental drugs and safety-related issues (3.33). In comparison, the lowest scores were obtained for the

elements "the medication's safety optional and not paid" (2.92), and "the Level of clinical knowledge about medications safety services (2.93)" with statistically significant difference between the responses($p<0.05$). All aspects of physicians' perception of barriers that prevent them from implementing medication safety in medical care were statistically significant between responses ($p<0.05$), explored in table 4. The scores for single-test reliability analysis of McDonald's ω was 0.908, Cronbach alpha was 0.908, Gutmann's λ2 was 0.911, Gutmann's λ6 was 0.959, and Greater Lower Bound was 0.986. In comparison, Bayesian Single-Test reliability analysis of McDonald's ω was 0.945, Cronbach alpha was 0.946, Gutmann's λ2 was 0.947, Gutmann's λ6 was 0.958, and Greater Lower Bound was 0.977.

Table 1: Demographic, social information

Locations	Response Count	Response Percent	p-value (X2)
Central area	73	54.07%	0.000
North area	25	18.52%	
South area	14	10.37%	
East area	13	9.63%	
West area	10	7.41%	
Answered question	**135**		
Skipped question	**118**		
Site of work	Response Count	Response Percent	p-value (X2)
MOH Hospitals	41	16.21%	0.000
Military hospitals	31	12.25%	
National Guard Hospital	25	9.88%	
Security forces hospitals	25	9.88%	
University hospital	40	15.81%	
MOH primary care centers	12	4.74%	
Private hospitals	48	18.97%	
Private ambulatory care clinics	16	6.32%	
Private primary healthcare center	15	5.93%	
Answered question	**253**		
Skipped question	**0**		
Gender	Response Count	Response Percent	
Male	47	39.50%	0.022
Female	72	60.50%	
Answered question	**119**		
Skipped question	**134**		
Age	Response Count	Response Percent	
24–35	72	59.02%	0.000
36–45	28	22.95%	
46–55	13	10.66%	
> 55	9	7.38%	
Answered question	**122**		
Skipped question	**131**		

Table 2: Demographic, social information

Physician Qualifications	Response Count	Response Percent	p-value (X2)
Intern	15	12.93%	0.025
Resident	31	26.72%	

General Practitioner	32	27.59%	
Specialist	22	18.97%	
Consultant	16	13.79%	
Answered question	**116**		
Skipped question	**137**		
Position Held	Response Count	Response Percent	
Director of medical departments	23	21.50%	0.389
Assistant director of the medical department	23	21.50%	
Supervisor	27	25.23%	
Physician staff	34	31.78%	
Answered question	**107**		
Skipped question	**146**		
Years of experience	Response Count	Response Percent	
> 1	26	23.42%	0.141
1-3	20	18.02%	
4-6	20	18.02%	
7-9	13	11.71%	
10-12	11	9.91%	
> 12	21	18.92%	
Answered question	**111**		
Skipped question	**142**		
Physician Specialties	Response Count	Response Percent	
Critical Care	11	9.73%	0.025
Emergency	9	7.96%	
Medical	23	20.35%	
Surgical	17	15.04%	
Pediatrics	16	14.16%	
Anesthesia	8	7.08%	
Psychiatry	6	5.31%	
Obstetrics and Gynecology	5	4.42%	
Family medicine	11	9.73%	
Ambulatory care	7	6.19%	
Answered question	**113**		
Skipped question	**140**		

Table 3: The Physician's Perception of Medication Safety

	Strongly Disagree		Disagree		Uncertain		Agree		Strongly agree		Total	Weighted Average	p-value
1- In our institution, medications safety policy and procedures well implemented	20.69%	18	18.39%	16	24.14%	21	29.89%	26	6.90%	6	87	2.84	0.013
2- Medications safety in medical care has led to positive changes	9.30%	8	24.42%	21	24.42%	21	31.40%	27	10.47%	9	86	3.09	0.003
3- This hospital promotes itself as an organization that responds to Medication Errors (MEs) and other safety-related issues	11.49%	10	25.29%	22	26.44%	23	31.03%	27	5.75%	5	87	2.94	0.000

4- I think there is under-implemented Medication safety elements in the hospital	11.90%	10	17.86%	15	29.76%	25	32.14%	27	8.33%	7	84	3.07	0.001
5- I feel comfortable to ask for help support from colleagues or peer concerning of Medication safety	14.12%	12	17.65%	15	28.24%	24	30.59%	26	9.41%	8	85	3.04	0.007
6- I have the opportunity to discuss and receive feedback about medications safety with other staff	14.12%	12	21.18%	18	24.71%	21	25.88%	22	14.12%	12	85	3.05	0.248
7- Medical staff feel like their mistakes are held against them when an event is reported	15.12%	13	16.28%	14	22.09%	19	36.05%	31	10.47%	9	86	3.10	0.002
8- There should be set guidelines for medication error disclosure in medical care.	14.81%	12	19.75%	16	24.69%	20	24.69%	20	16.05%	13	81	3.07	0.477
9- I believe that is medication safety training should be included in medical education.	10.47%	9	17.44%	15	22.09%	19	34.88%	30	15.12%	13	86	3.27	0.005
10- I think the therapeutic guidelines is not widely implemented at most of healthcare institutions	9.41%	8	23.53%	20	30.59%	26	31.76%	27	4.71%	4	85	2.99	0.000
11- I believe that's continuing education should include medication safety.	5.95%	5	21.43%	18	22.62%	19	33.33%	28	16.67%	14	84	3.33	0.002
12- The average patient does not want to know about medications error that did not cause them harm	9.41%	8	17.65%	15	30.59%	26	30.59%	26	11.76%	10	85	3.18	0.002
13- I will encourage my colleagues to create medications safety culture in medical care	8.43%	7	14.46%	12	36.14%	30	28.92%	24	12.05%	10	83	3.22	0.000
14- Medication's wastage services are very essential in medical care	5.95%	5	16.67%	14	30.95%	26	34.52%	29	11.90%	10	84	3.30	0.000
15- Medications storage with labeling is crucial elements of medications safety	10.71%	9	13.10%	11	32.14%	27	30.95%	26	13.10%	11	84	3.23	0.001
16- Electronic prescribing in dental had positive outcome to patients	9.41%	8	16.47%	14	30.59%	26	34.12%	29	9.41%	8	85	3.18	0.000
17- Alerting system of drug interactions and pregnancy or lactation prevent medications errors	6.98%	6	20.93%	18	30.23%	26	32.56%	28	9.30%	8	86	3.16	0.000
18- The off-labeling system in dental care should be implemented to protect the dentist from any liability	11.63%	10	17.44%	15	27.91%	24	33.72%	29	9.30%	8	86	3.12	0.001
19- The medications safety course is Not given at most healthcare institutions	10.71%	9	20.24%	17	26.19%	22	34.52%	29	8.33%	7	84	3.10	0.001
20- The health insurance not coveted most of medications safety measures in medical care	5.88%	5	16.47%	14	34.12%	29	32.94%	28	10.59%	9	85	3.26	0.000
Answered											**87**		
Skipped											**166**		

Table 4: The barriers prevent implementing medication safety in medical care

	Strongly Disagree		Disagree		Uncertain		Agree		Strongly agree		Total	Weighted Average	p-value
Level of clinical knowledge about medications safety services	8.05%	7	26.44%	23	33.33%	29	28.74%	25	3.45%	3	87	2.93	0.000

Uncertain association between the medication and safety related issues	5.68%	5	15.91%	14	31.82%	28	32.95%	29	13.64%	12	88	3.33	0.000
The medication safety is Not serious nature or unusual	10.34%	9	13.79%	12	28.74%	25	35.63%	31	11.49%	10	87	3.24	0.000
Concern that a report will produce the extra work.	3.45%	3	17.24%	15	29.89%	26	40.23%	35	9.20%	8	87	3.34	0.000
Lack of time to perform medical medications safety	8.24%	7	20.00%	17	28.24%	24	34.12%	29	9.41%	8	85	3.16	0.000
Unaware of the existence of a national medication safety system.	8.05%	7	14.94%	13	35.63%	31	36.78%	32	4.60%	4	87	3.15	0.000
Did not know how to implement medications safety	10.23%	9	17.05%	15	32.95%	29	28.41%	25	11.36%	10	88	3.14	0.001
Fear of legal liability.	6.90%	6	17.24%	15	32.18%	28	35.63%	31	8.05%	7	87	3.21	0.000
Unaware of the need of medications safety services	12.79%	11	17.44%	15	32.56%	28	30.23%	26	6.98%	6	86	3.01	0.000
Lack of financial reimbursement.	11.49%	10	16.09%	14	32.18%	28	35.63%	31	4.60%	4	87	3.06	0.000
Don't feel the need to report well recognized safety for a certain drug	8.14%	7	19.77%	17	32.56%	28	33.72%	29	5.81%	5	86	3.09	0.000
Consider it the medical doctor or pharmacist ’s responsibility	5.95%	5	14.29%	12	29.76%	25	42.86%	36	7.14%	6	84	3.31	0.000
The negative consequences associated with medications safety services	7.06%	6	17.65%	15	31.76%	27	28.24%	24	15.29%	13	85	3.27	0.002
Lack of Periodic training of medical staff medications safety services	7.95%	7	23.86%	21	34.09%	30	25.00%	22	9.09%	8	88	3.03	0.000
Insufficient informing dental care providers about medications safety	10.34%	9	24.14%	21	31.03%	27	22.99%	20	11.49%	10	87	3.01	0.009
The medications safety is optional and not paid	11.63%	10	20.93%	18	37.21%	32	24.42%	21	5.81%	5	86	2.92	0.000
The medications safety services were Not taught properly in dental School	6.82%	6	22.73%	20	29.55%	26	35.23%	31	5.68%	5	88	3.10	0.000
Answered											**89**		
Skipped											**164**		

Table 5. Factors (average scores) influencing the physician's Perception of Medication Safety and the barriers that prevent implementing medication safety in medical care

		physician's Perception of Medication Safety							**The barriers prevent implementing medication safety in medical care**						
	Factors	N	Avg. scores	Std. D	Median	Lower Bound	Upper Bound	P-value	N	Avg. scores	Std. D	Median	Lower Bound	Upper Bound	P-value
Region	Central	46	3.1987	.62319	3.0838	3.0137	3.3838	0.294	46	3.1287	.60561	3.0588	2.9489	3.3086	0.420
	North	16	3.0212	.77439	2.9750	2.6086	3.4339		16	3.2576	.54756	3.0938	2.9659	3.5494	
	South	7	2.9921	.60034	3.0500	2.4369	3.5473		7	2.9916	.21325	3.0000	2.7944	3.1888	
	East	6	3.2583	.43865	3.3000	2.7980	3.7187		6	3.2810	.33909	3.2549	2.9252	3.6369	

	West	3	3.5500	.47697	3.6000	2.3651	4.7349		3	3.0980	.91192	3.1176	.8327	5.3634	
	Total	78							78						
Site of works	MOH Hospitals	20	3.0608	.73145	3.0000	2.7185	3.4031	0.143	20	3.2359	.52013	3.1176	2.9925	3.4793	0.360
	Military hospitals	11	3.3447	.68336	3.1579	2.8856	3.8038		11	3.0943	.36102	3.0625	2.8518	3.3369	
	National Guard Hospital	9	2.6101	.64158	2.8000	2.1170	3.1033		9	2.8366	.77190	2.9412	2.2433	3.4299	
	Security forces hospitals	4	3.2000	59582	3.1000	2.2519	4.1481		4	3.0542	.56403	2.8235	2.1567	3.9517	
	University hospital	17	3.2337	.57522	3.1176	2.9380	3.5295		17	3.3491	.64797	3.1765	3.0159	3.6822	
	MOH primary care centers	4	3.4178	.16998	3.3855	3.1473	3.6882		4	3.1075	.23738	3.1765	2.7298	3.4853	
	Private hospitals	7	3.2759	.48781	3.2500	2.8248	3.7271		7	3.2689	.55687	3.2941	2.7539	3.7839	
	Private ambulatory care clinics	3	3.6667	.32532	3.6500	2.8585	4.4748		3	2.9608	.08985	2.9412	2.7376	3.1840	
	Private primary healthcare center	3	3.2500	.43589	3.0500	2.1672	4.3328		3	2.7778	.57979	2.8235	1.3375	4.2180	
	Total	78							78						
Age	24–35	49	3.1259	.48115	3.0000	2.9877	3.2641	0.467	49	3.1737	.45051	3.0625	3.0443	3.3031	0.138
	36–45	16	3.1534	.97306	3.2088	2.6349	3.6719		16	3.0843	.81647	3.1765	2.6493	3.5194	
	46–55	6	3.3583	.94785	3.4250	2.3636	4.3530		6	3.5268	.60048	3.6078	2.8966	4.1569	
	> 55	7	3.2643	.40074	3.2500	2.8937	3.6349		7	2.8487	.38251	2.9412	2.4950	3.2025	
	Total	78							78						
Gender	Male	31	3.2010	.76172	3.0500	2.9216	3.4804	0.700	31	3.1451	.64969	3.1176	2.9068	3.3834	0.894
	Female	47	3.1360	.54483	3.0500	2.9761	3.2960		47	3.1589	.49647	3.0588	3.0131	3.3046	
	Total	78							78						
Physician Qual.	Intern	11	2.9932	.31833	2.9412	2.7794	3.2071	0.330	11	2.9677	.26834	2.9412	2.7874	3.1480	0.464
	Resident	21	3.0970	.49503	3.0000	2.8717	3.3223		21	3.1804	.48199	3.0625	2.9610	3.3998	
	General Practitioner	20	3.1148	.74860	3.1338	2.7645	3.4652		20	3.2724	.59018	3.1801	2.9962	3.5486	

	Specialist	14	3.3341	.46731	3.3855	3.0643	3.6039		14	3.1016	.47715	3.1471	2.8261	3.3771	
	Consultant	12	3.3075	.98276	3.3000	2.6830	3.9319		12	3.1384	.87087	3.1250	2.5851	3.6917	
	Total	78							78						
Physician specialties	Critical Care	8	2.6112	.79596	2.8697	1.9457	3.2766	0.768	8	2.8176	.78586	3.0882	2.1607	3.4746	0.075
	Emergency	6	3.2487	1.13289	3.1000	2.0598	4.4376		6	3.6246	.49258	3.5042	3.1076	4.1415	
	Medical	18	3.1803	.43543	3.0000	2.9638	3.3968		18	2.9361	.40446	2.9099	2.7350	3.1372	
	Surgical	11	3.4693	.62602	3.2500	3.0487	3.8899		11	3.2193	.60224	3.0000	2.8147	3.6238	
	Pediatrics	13	3.1613	.51618	3.1500	2.8494	3.4733		13	3.1933	.42985	3.0625	2.9336	3.4531	
	Anesthesia	4	3.0978	.61038	2.8456	2.1265	4.0691		4	2.7794	.13043	2.7647	2.5719	2.9870	
	Psychiatry	5	3.0342	.62927	2.8500	2.2529	3.8156		5	3.0353	.20426	3.1250	2.7817	3.2889	
	Obstetrics and	2	2.8250	.24749	2.8250	.6014	5.0486		2	3.5625	.79550	3.5625	-3.5847	10.7097	
	Family medicine	8	3.3602	.62852	3.4750	2.8347	3.8857		8	3.5221	.62049	3.8529	3.0033	4.0408	
	Ambulatory care	3	3.2149	.35708	3.1500	2.3279	4.1020		3	3.4350	.65429	3.1176	1.8097	5.0604	
	Total	78							78						
Position	Director of medical department	17	3.2582	.71523	3.0500	2.8905	3.6259	0.479	17	3.3155	.65132	3.0588	2.9806	3.6504	0.823
	Assistant director of the medical department	20	3.0612	.54718	2.9224	2.8051	3.3173		20	3.1157	.38084	3.0646	2.9375	3.2940	
	Supervisor	20	3.1257	.60942	3.1276	2.8405	3.4109		20	3.1494	.54145	3.0882	2.8960	3.4028	
	Physician staff	21	3.2142	.69877	3.1176	2.8961	3.5323		21	3.0618	.64186	3.1176	2.7696	3.3540	
	Total	78							78						
Experience	<1	22	3.0293	.41641	2.9750	2.8447	3.2139	0.224	22	3.0326	.31178	3.0588	2.8944	3.1709	0.192
	1-3	13	3.1611	.52904	3.0000	2.8414	3.4808		13	3.3340	.51615	3.1765	3.0221	3.6459	

	4-6	15	3.0927	.65312	3.0500	2.7311	3.4544		15	3.1238	.48207	2.8824	2.8569	3.3908	
	7-9	7	3.1351	.36071	3.0500	2.8015	3.4686		7	3.0166	.58072	3.2353	2.4796	3.5537	
	10-12	8	3.2585	1.1933	3.0838	2.2609	4.2560		8	2.8575	.97384	3.0000	2.0434	3.6717	
	>12	13	3.4217	.70741	3.3500	2.9942	3.8491		13	3.4669	.57622	3.2941	3.1187	3.8151	
	Total	78							78						

Table 6: Multiple regression of Factors with the physician's Perception of Medication Safety

Model		R	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
						B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.301 [b]	.091	.859	.555[b]	2.882	0.393		7.340	0.000	2.098	3.665		
	Location					-0.017	0.068	-0.031	-0.250	0.803	-0.153	0.119	0.880	1.136
	Site of work					0.032	0.033	0.123	0.981	0.330	-0.033	0.098	0.842	1.188
	Age (years)					-0.093	0.110	-0.142	-0.847	0.400	-0.313	0.126	0.468	2.135
	Physician gender					-0.078	0.158	-0.061	-0.495	0.622	-0.393	0.237	0.880	1.136
	Physician Qualifications					0.070	0.069	0.141	1.014	0.314	-0.068	0.207	0.683	1.465
	Physician Specialties					0.032	0.030	0.129	1.070	0.288	-0.028	0.092	0.912	1.097
	Current Position					-0.041	0.071	-0.072	-0.584	0.561	-0.183	0.100	0.857	1.168
	Years of experiences					0.071	0.057	0.205	1.246	0.217	-0.043	0.186	0.486	2.059

a. Dependent Variable: physician's Perception of Medication Safety, Predictors [b]: (Constant), Location, Site of work, Age (years), Physician gender, Physician Qualifications, Physician Specialties, and Your Current Position

Bootstrap for Coefficients

Model		B	Bootstrap [a]				
			Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	2.882	0.000	0.326	0.001	2.244	3.519
	Location	-0.017	-0.004	0.066	0.784	-0.157	0.113
	Site of work	0.032	0.000	0.037	0.369	-0.043	0.106
	Age (years)	-0.093	0.010	0.095	0.288	-0.269	0.111
	Physician gender	-0.078	0.006	0.174	0.643	-0.407	0.272
	Physician Qualifications	0.070	-0.004	0.066	0.274	-0.067	0.200
	Physician Specialties	0.032	-0.001	0.032	0.324	-0.030	0.096

	Current Position	-0.041	0.004	0.076	0.573	-0.191	0.106
	Years of experiences	0.071	-0.006	0.062	0.246	-0.063	0.190
a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples							

Table 7: Multiple regression of Factors with the barriers prevent implementing medication safety in medical care

Model		R	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
						B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.487 [b]	.237	2.672	.010[b]	2.876	0.321		8.967	0.000	2.236	3.515		
	Location					0.041	0.056	0.082	0.734	0.465	-0.071	0.153	0.869	1.151
	Site of work					-0.023	0.027	-0.099	-0.851	0.398	-0.078	0.031	0.794	1.259
	Age (years)					-0.247	0.091	-0.407	-2.713	0.008	-0.429	-0.065	0.477	2.095
	Physician gender					0.082	0.132	0.069	0.623	0.535	-0.181	0.345	0.875	1.143
	Physician Qualifications					0.086	0.057	0.189	1.514	0.134	-0.027	0.200	0.689	1.451
	Physician Specialties					0.085	0.024	0.387	3.534	0.001	0.037	0.133	0.898	1.114
	Current Position					-0.144	0.058	-0.278	-2.476	0.016	-0.261	-0.028	0.850	1.177
	Years of experiences					0.100	0.048	0.309	2.095	0.040	0.005	0.195	0.492	2.031

a. Dependent Variable: The barriers prevent implementing medication safety in medical care, Predictors [b]: (Constant), Location, Site of work, Age (years), Physician gender, Physician Qualifications, Physician Specialties, and Your Current Position

Bootstrap for Coefficients

Model		B	Bootstrap [a]				
			Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	2.876	-0.008	0.276	0.001	2.289	3.403
	Location	0.041	0.003	0.058	0.453	-0.066	0.164
	Site of work	-0.023	0.000	0.026	0.374	-0.075	0.028
	Age (years)	-0.247	0.013	0.090	0.008	-0.400	-0.041
	Physician gender	0.082	-4.766E-05	0.140	0.536	-0.175	0.375
	Physician Qualifications	0.086	-0.008	0.056	0.127	-0.035	0.182
	Physician Specialties	0.085	0.000	0.029	0.008	0.030	0.143
	Current Position	-0.144	0.001	0.062	0.022	-0.263	-0.027
	Years of experiences	0.100	0.000	0.045	0.031	0.005	0.184

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Factors affecting the physician's perception about the medication safety and the barriers that prevent implementing medication safety in medical care

Numerous factors influence the physician's perception of medication safety, and the barriers prevent implementation of medication safety in medical care. However, all factors like locations, worksite, physician age, physician gender, physician qualifications, and years of experience. Furthermore, position in medical career did not influence the physician's practice of Medication safety, or the barriers prevent implementation of medication safety in medical care with non-statically significant differences ($p>0.05$) as shown in table 5.

The relationship between physician's perception of medication safety and factors included the location, worksite, age (years), gender, qualification and specialties, medical work experience, and position. It was revealed through a multiple regression model and measured the physician's perception of medication safety dependent variable, and factors were measured as an expletory variable. There was a weak relationship R (0.301) with ($p=0.555$) between physician's perception of medication safety and factors. However, no relationship among all factors was non-significant differences ($p>0.05$) as explored in table 6.

The relationship between a physician's perception of the barriers to implementing medication safety in medical care and factors such as location, workplace, age (years), physician gender, physician qualifications, physician specialties, years of experience in a medical career, and position held. It was discovered using a multiple regression model, and the dependent variable was the physician's perception of medication safety, while the factors were measured as an expletory variable. Between physicians' perceptions of the barriers and factors, there was a medium relationship R (0.487) with ($p=0.019$). Most factors have no relationship and have non-significant differences ($p>0.05$). However, four factors, including physician age, explained 40.7 percent of the negative relationship and 38.7 percent of the positive relationship. The variation in the physician's perception of barriers prevents medication safety implementation in medical care with statistically significant ($p=0.008$) and ($p=0.001$) respectively through multiple regression model and confirmed by Bootstrap model. The absence of multi-collinearity with the physician age factor with Variance Inflation Factor (VIF=2.095) and physician specialties (VIF=1.114) less than three or less than ten confirmed the relationship. The variation in the physician's perception of barriers prevent implementing medication safety in medical care with a statistically significant ($p=0.016$) and ($p=0.040$) respectively through multiple regression model and confirmed by Bootstrap model was explained by the physician's current position and physician experiences. The lack of multi-collinearity with the physician current position factor with Variance Inflation Factor (VIF=1.177) and physician experiences (VIF=2.031) less than three or less than five [19-21] as explored in table 7.

Discussion

The physician's perception of medication safety is required for medical knowledge and practice. [3,22]. This current investigation explored the information through the self-administration of the survey distributed to the physicians. Most of the responders were young, recent graduates with a limited experience had expressed their perception of medication safety. This reflects that the new generation of physicians are willing to participate in the research or have the time to respond to the questionnaire. The physician's perception of medication safety is inadequate, ranking lower than the previous study on dental perception of medication safety [5]. There were different practices and perceptions among physicians more than dentists [5]. The physicians agreed that drug safety education is necessary, and physicians believe the medical waste is an essential part of medication safety, which is similar to past dental studies [5]. The physicians are correct about the medications safety educational course because there are no such course requirements like Basic Life Support (BLS). On the other hand, physicians believe that medication waste is necessary to implement. This reflects the physician's lack of knowledge about medication safety. There are various critical medications safety issues such as high-risk medications and use of unapproved indications. The physicians agreed with multiple elements of medications safety that are considered vital for them but are not implemented in healthcare organizations, such as medications safety policies and responding to medication errors or drug-related problems, which resembled previous dental study [5]. The responses received reflect the actual situation of the practice. There was a clear difference between the responders' answers for all physician perception elements. However, two aspects of perception were no statistically significant differences among all types of answers, including feedback on medications safety and medication errors disclosure guidelines which differed from the previous dental study [5]. It appeared that there was real difference in understanding the questions or an accurate perception among physicians. Further analysis is required to evaluate the survey to determine the appropriateness of each question.

The physician's perception of barriers to medications safety implementation of was insufficient or disagreed with the obstacles, which differed from the previous dental study [5]. Most physicians admitted that they were overworked in their practices. Furthermore, the physicians believed that there was no relationship between the medication and related safety elements that

differed from previous dental studies [5], indicating insufficient knowledge of medications safety or a wrong perception of medications safety. The physicians disagreed that medication safety should be optional and that the level of knowledge obtained was considered as barriers to medication safety implementation, which differed from the past dental study [5]. There were no factors that affected or changed the perception of medications safety that influenced the medications safety barriers of implementation such as geographical location, physicians' age, work site, physician's specialties or practice experiences, and positions held in medical care career, which resembled the previous dental study [5]. However, the age factor may affect the physician's perception to a negative impact because young physicians are more interested in implementing the medication's safety, whereas older physicians are not.

Furthermore, the physician's specialties may be influencing factors in changing the perception to positive, which can be done with a greater desire and willingness to change medication safety practice. On the contrary, various factors influence the perception toward barriers of medications safety implementation. For example, if it becomes higher, the physician's position may become a determining factor in changing negative perceptions toward the medication's safety barriers. However, in contrast to the previous dental study, the experiences-dependent factor to positive change perception toward barriers prevents the implementation of medication safety [5]. As a result, having more experience with physicians can help to overcome most obstacles and improve medication safety procedures in medical practices.

Limitations

Though the survey on medications safety perception by physician had adequate amount of information, it had various limitations that such as the age difference, location, experience, and positions held in medical practice. Thus, it reflected only one side of perception. In addition, the sample size was not sufficient to represent all physicians. Further studies in the future with equal demographic information about responders is required.

Conclusion

The perception of medications safety elements or barriers that prevents implementation was inadequate. However, there are various factors that depended on changing the perception like physician's age, positions, and years of experience. Therefore, medication safety education and training are required. Besides medications, safety aspects implementation and removing the barriers are highly recommended. More research with larger sample sizes and equal demographic information on physicians is recommended.

Acknowledgement:

The authors would like to thank the Deanship of Scientific Research at Shaqra University for supporting this work.

Conflict of interest:

The authors declare no conflicts of interest.

Funding:

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

Consent for publications:

Informed consent was obtained from all the participants

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