

# Voluntary/Charitable Pharmaceutical Care Knowledge in Saudi Arabia

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Received: 12-09-2022;

Accepted: 01-12-2022.

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[www.ptbreports.org](http://www.ptbreports.org)

DOI:  
10.5530/PTB.2023.9.2

## ABSTRACT

**Objectives:** To explore the pharmacist's knowledge about voluntary or charitable pharmaceutical care in Saudi Arabia. **Materials and Methods:** It analyzes a cross-sectional survey discussing pharmacist's knowledge about voluntary or charitable pharmaceutical care services in Saudi Arabia. The survey consisted of respondents' demographic information about pharmacists and general information about charity pharmacy practice, pharmacists' knowledge about voluntary or charitable pharmaceutical care services, and voluntary or charitable pharmacy practice resources. The 5-point Likert response scale system was used with closed-ended questions. The survey was validated through the revision of expert reviewers and pilot testing. Besides, various tests of reliability, McDonald's  $\omega$ , Cronbach alpha, Gutmann's  $\lambda_2$ , and Gutmann's  $\lambda_6$  been done with the study. The data analysis of the pharmacist knowledge of charity pharmacies is done through the survey monkey system. Besides, the Statistical Package of Social Sciences (SPSS), Jeffery's Amazing Statistics Program (JASP), and Microsoft Excel sheet version 16. **Results:** A total number of 578 pharmacists responded to the questionnaire. One-half of the responders knew about pharmacy volunteering activities 230 (57.09%). Most pharmacists did not participate in the volunteering activities because they did not have time for it 197 (41.21%), they did not need it 141 (29.50%), and they did not take any educational or training 120 (25.10%), or volunteering activities is difficult to understand 105 (21.97%). Less than one-half of responders only know where to go if they want to participate in Charity Pharmacy at their work 243 (42.26%) or participate in Charity Pharmacy outside their work 259 (44.97%). The average score of level knowledge of the pharmacy volunteer was (3.44). The element "Vision and mission of Charity Pharmacy" obtained the highest score (3.81). The average score of the level information of the resources about charity pharmacies was (3.52). The resources of the "Governmental sector" obtained the highest score (3.71), followed by "General medical or health society" (3.59). **Conclusion:** The average knowledge of pharmacy professionals of charitable pharmaceuticals care services was insufficient. Therefore, targeting awareness and training programs about charitable pharmacy services is highly suggested to improve learning and participation in the future.

**Keywords:** Voluntary, Charitable, Pharmaceutical Care, Knowledge, Pharmacist, Saudi Arabia.

## INTRODUCTION

The strategic planning of Saudi Vision focused on three sectors to provide services to all citizens and residents in the Kingdom of Saudi Arabia (KSA). That includes the government sector, private and charity services.<sup>1</sup> The charitable or voluntary work can be various services, province environment of bug control pollution, environmental education, health, and animal protection.<sup>2</sup> Thus, National Center for Non-Profit Sector was established to set up strategies, laws, and regulations for non-profit organizations and societies of voluntary work or activities in KSA, including non-profit or charitable healthcare organizations and associations.<sup>2</sup> The Ministry of Health set up a healthcare strategic plan based on the Saudi Vision and included the charitable healthcare sector.<sup>3</sup> MOH Volunteering platform as part of Volunteering activities for all healthcare providers overall in Saudi Arabia.<sup>4</sup> The platform provides all voluntary healthcare work and activities available for all types of healthcare professionals for participation, with accounting, and provides an official certificate of voluntary healthcare performances, including voluntary pharmaceutical care services.<sup>4</sup> The Ministry of Health encourages all healthcare professionals to

participate in voluntary or charitable healthcare services.<sup>4</sup> The Strategic pharmacy plan did not fully include voluntary or charitable pharmaceutical care services in its goals and initiatives. However, some authors suggested an initiative project of voluntary or charitable pharmaceutical care services locally and illustrated Vision, mission, and suggested goals of the charitable pharmacy in Saudi Arabia, emphasizing the pharmacist's voluntary performance or activities.<sup>5</sup> Various investigations have been conducted about voluntary or charitable pharmaceutical care services around the world.<sup>6-14</sup> Furthermore, the authors are unaware of any research on pharmacist's knowledge about voluntary or charitable pharmaceutical care locally or in Gulf and Arabic countries. The current study aims to explore the knowledge of pharmacists about voluntary or charitable pharmacy practice in Saudi Arabia.

## MATERIALS AND METHODS

It analyzes a cross-sectional survey discussing pharmacist's knowledge about voluntary or charitable pharmaceutical care services in Saudi Arabia. It self-reported an electronic survey of

the pharmacist, including pharmacists from internship to consultant, pharmacist specialties, and Saudi Arabia. All non-pharmacist or students, non-completed, non-qualified surveys will be excluded from the study. The survey consisted of respondents' demographic information about pharmacists and general information about charitable pharmaceutical care, the knowledge of pharmacists about voluntary or charitable pharmaceutical care services, and voluntary or charitable pharmacy knowledge resources.<sup>5-14</sup> The 5-point Likert response scale system was used with closed-ended questions. According to the previous literature with an unlimited population size, the sample was calculated as a cross-sectional study, with a confidence level of 95% with a z score of 1.96 and a margin of error of 5%, a population percentage of 50%, and drop-out rate of 10%. As a result, the sample size will equal 380-420 with a power of study of 80%.<sup>15-17</sup> The response rate required for the calculated sample size is at least 60-70% and above.<sup>17,18</sup> The survey was distributed through social media of WhatsApp and Telegram groups pharmacists. The reminder message had been sent every 1-2 weeks. The survey was validated through the revision of expert reviewers and pilot testing. Besides, various tests of reliability, McDonald's  $\omega$ , Cronbach alpha, Gutmann's  $\lambda_2$ , and Gutmann's  $\lambda_6$  been done with the study. The data analysis of the pharmacist's knowledge of pharmacy charity is done through the survey monkey system. Besides, the Statistical Package of Social Sciences (SPSS), Jeffery's Amazing Statistics Program (JASP), and Microsoft Excel sheet version 16. It included a description and frequency analysis, good of fitness analysis, and correlation analysis. Besides, inferential analysis of factors affecting pharmacist's knowledge about voluntary or charitable pharmaceutical care services and type of charitable pharmacy knowledge resources with linear regression. The STROBE (Strengthening the Reporting of Observational Studies in Epidemiology Statement: guidelines for reporting observational studies) guided the reporting of the current study.<sup>19,20</sup>

## RESULTS

A total number of 578 pharmacists responded to the questionnaire. Of them, one-third responded from the Central region (180 (31.14%)), and one Quarter responded from the western region (140 (24.22%)), with statistically significant differences between the provinces ( $p=0.000$ ). Most of the responders were from MOH Government Hospital (184 (32.11%)), General Medical Directorate in Region (93 (16.23%)), and Community pharmacy (89 (15.53%)), with a statistically significant difference between working sites ( $p=0.000$ ). Most responders were Saudi 446 (77.16%), with a statistically significant difference with non-Saudi (32 (5.54%)). Males responded more than females (373 (64.53%)) versus 205 (35.47%), with statistically significant differences among gender ( $p=0.001$ ). Most of the responders were in the age group of 35-44 years (155 (26.82%)), age group 25-34 years (144 (24.91%)), age group 45-54 years (126 (21.80%)), and with statistically significant differences between all age groups ( $p=0.000$ ). Most of the responders held a Bachelor (134 (23.34%)), Doctor of Philosophy (130 (22.65%)), and Master (110 (19.16%)), with statistically significant differences between all levels ( $p=0.000$ ). Most of the pharmacists were staff pharmacists (235 (40.66%)) and General Managers (125 (21.63%)), with statistically significant differences between all levels ( $p=0.000$ ). Most pharmacists had a work experience of 6-10 years (225 (39.34%)) and <3 years (114 (19.93%)), with a statistically significant difference between years of experience ( $p=0.000$ ). There was a strong positive correlation between age (years) and years of experience based on Kendall's tau\_b (0.720) and Spearman's rho (0.804) correlation coefficients, with a statistically significant difference between the two factors ( $p<0.000$ ). There was a medium positive correlation between the site of work and last academic qualifications based on Kendall's tau\_b (0.448) and Spearman's rho (0.536), with a statistically significant difference between the two factors

( $p<0.000$ ). There was a medium positive correlation between gender and Nationality based on Kendall's tau\_b (0.467) and Spearman's rho (0.467) correlation coefficients, with a statistically significant difference between the two factors ( $p<0.000$ ). (Tables 1 and 2).

One-half of the responders knew about pharmacy volunteering activities 230 (57.09%). Most pharmacists did not participate in the volunteering activities because they did not have time for it 197 (41.21%), they did not need it 141 (29.50%), and they did not take any educational or training 120 (25.10%) or volunteering activities are difficult to understand 105 (21.97%). Less than one-half of responders only know where to go if they want to participate in Charity Pharmacy at their work 243 (42.26%) or participate in Charity Pharmacy outside their work 259 (44.97%) (Table 3). The average score of level knowledge of the pharmacy volunteer was (3.44). The element "Vision and mission of Charity Pharmacy" obtained the highest score (3.81). In contrast, the lowest score was obtained for the aspect "competency of Charity Pharmacy" (3.16), with a statistically significant difference between the responses ( $p<0.000$ ). All aspects of the knowledge of pharmacists about charitable pharmaceutical care were statistically significant between responses ( $p<0.000$ ) (Table 4). The average score of the level of information of the resources about charitable pharmaceutical care was (3.52). The resources of the "Governmental sector" obtained the highest score (3.71), followed by "General medical or health society" (3.59). In contrast, the lowest score was obtained for the resources "Project management administration" (3.38), and the resources "Pharmacy society or associations" was (3.46) with a statistically significant difference between the responses ( $p<0.000$ ). All aspects of the pharmacist-level knowledge of pharmacy volunteering were statistically significant between responses ( $p<0.000$ ) (Table 5). The score for single-test reliability analysis of McDonald's  $\omega$  was 0.937, Cronbach's  $\alpha$  was 0.933, Gutmann's  $\lambda_2$  0.947, Gutmann's  $\lambda_6$  was 0.988, and Greater Lower Bound was 0.993 with statistically significant ( $p<0.05$ ).

### Factors affecting the knowledge of pharmacists about charitable pharmaceutical care

Factors affecting the perception were analyzed. We adjusted the significant values using the independent samples Kruskal-Wallis test and the Bonferroni correction for multiple tests. **Knowledge of pharmacists about charitable pharmaceutical care** includes Location, Site of work, **nationality**, Pharmacist gender, age (years), Academic qualifications, Years of experience in a pharmacy career, Position, knowledge of pharmacy volunteering activities, knowledge of Charity Pharmacy at inside work, and knowledge of Charity Pharmacy at outside work. Five locations affected the **knowledge of pharmacists about charitable pharmaceutical care**. The central region showed the lowest scores (2.3218), with statistically significant differences between regions ( $p=0.004$ ). Fourteen worksites affected the **knowledge of pharmacists about charitable pharmaceutical care**. The general medical directorate in region and community pharmacy obtain the lowest score (1.7548) and (2.1596), respectively, with a statistically significant difference between working sites ( $p=0.000$ ) with significance among all sites. The Nationality was non-statistically significant and affected pharmacists' knowledge **about charitable pharmaceutical care** ( $p=0.953$ ). The female gender score showed a higher score (2.8556) than the male (2.3882) of **knowledge of pharmacists about charitable pharmaceutical care** with a statistically significant difference ( $p=0.000$ ). The responders' age affected pharmacists' knowledge **about charitable pharmaceutical care**. Pharmacists aged 18-24 showed the lowest score (2.1958), with a statistically significant difference between all age groups ( $p=0.000$ ). Six levels of academic qualifications affected pharmacists' knowledge **about charitable pharmaceutical care**. The lowest score (1.5472) was obtained with a diploma degree, with a statistically significant difference between

Nationality	Response Count	Response Percent	p-value (X2)	
Central area	180	31.14%	0.000	
North area	62	10.73%		
South area	104	17.99%		
East area	92	15.92%		
West area	140	24.22%		
<b>Answered question</b>	<b>578</b>			
<b>Skipped question</b>	<b>0</b>			
Site of work	Response Count	Response Percent	p-value (X2)	
Ministry of Health	72	12.57%	0.000	
General Medical Directorate in Region	93	16.23%		
MOH government Hospital	184	32.11%		
Non-MOH government sectors (including Hospital)	48	8.38%		
MOH-Primary Care Center	7	1.22%		
Private Hospital	34	5.93%		
Private Primary Care Center	15	2.62%		
Community pharmacy	89	15.53%		
University	17	2.97%		
Unemployment	6	1.05%		
Pharmaceutical companies	6	1.05%		
students	2	0.35%		
<b>Answered question</b>	<b>573</b>			
<b>Skipped question</b>	<b>5</b>			
Nationality				
Saudi	446	77.16%	0.000	
Non-Saudi	132	22.84%		
<b>Answered question</b>	<b>578</b>			
<b>Skipped question</b>	<b>0</b>			
Gender	Response Count	Response Percent		
Male	373	64.53%	0.000	
Female	205	35.47%		
<b>Answered question</b>	<b>578</b>			
<b>Skipped question</b>	<b>0</b>			
Age	Response Count	Response Percent		
18 - 24	95	16.44%	0.000	
25 - 34	144	24.91%		
35 - 44	155	26.82%		
45 - 54	126	21.80%		
55 - 64	54	9.34%		
65 - 74	4	0.69%		
75 or older	0	0.00%		
<b>Answered question</b>	<b>578</b>			
<b>Skipped question</b>	<b>0</b>			

Pharmacist Qualifications	Response Count	Response Percent	p-value (X2)
Diploma	73	12.72%	
Bachelor	134	23.34%	
Master	110	19.16%	
Ph.D.	130	22.65%	
Residency	69	12.02%	
Fellowship	0	0.00%	
Pharm D	58	10.10%	
Internship	0	0.00%	
<b>Answered question</b>	<b>574</b>		
<b>Skipped question</b>	<b>4</b>		
Position Held	Response Count	Response Percent	
General Manager	125	21.63%	0.000
Manager	66	11.42%	
Director	64	11.07%	
Supervisor	79	13.67%	
Staff	235	40.66%	
Deputy Director of Pharmacy	0	0.00%	
Internship	2	0.35%	
Unemployment	7	1.21%	
<b>Answered question</b>	<b>578</b>		
<b>Skipped question</b>	<b>0</b>		
Years of experience in a pharmacy career	Response Count	Response Percent	
<3	114	19.93%	0.000
3-5	78	13.64%	
6-10	225	39.34%	
11-15	90	15.73%	
> 15	65	11.36%	
<b>Answered question</b>	<b>572</b>		
<b>Skipped question</b>	<b>6</b>		

all levels ( $p=0.000$ ). Five levels of work experience affected pharmacists' knowledge *about charitable pharmaceutical care*, with a statistically significant difference between all levels ( $p=0.000$ ). The highest score (3.0554) was obtained for those with work experience of > 15 years, with a statistically significant difference between all levels ( $p=0.000$ ). Seven levels of the position affected pharmacists' knowledge *about charitable pharmaceutical care*, with the lowest score (1.8242) obtained for the pharmacy manager with a statistically significant difference between all levels ( $p=0.000$ ). The knowledge of pharmacy volunteering activities was non-statistically significant and affected pharmacists' knowledge *about charitable pharmaceutical care* ( $p=0.830$ ). The presence of knowledge of Charity Pharmacy inside work had the lowest score (1.9819), was statistically significant, and affected pharmacists' knowledge *about charitable pharmaceutical care* ( $p=0.000$ ). The non-presence knowledge of Charity Pharmacy at outside work had the lowest score (2.0836), was statistically significant, and affected pharmacists' knowledge *about charitable pharmaceutical care* ( $p=0.000$ ). The relationship between the knowledge of *charitable pharmaceutical care* and factors such as location, worksite, nationality, gender, age

Do you have any knowledge of pharmacy volunteering activities	Response Count	Response Percent	p-value (X2)
Yes	330	57.09%	0.001
No	248	42.91%	
<b>Answered question</b>	<b>578</b>		
<b>Skipped question</b>	<b>0</b>		
If the answer is No, can you mention the reasons volunteering activities	Response Count	Response Percent	
I do not need it	141	29.50%	
I do not take any educational or training courses	120	25.10%	
It isn't easy to understand	105	21.97%	
I do not have time for it	197	41.21%	
There is no support from my work	42	8.79%	
I do not know about it	6	1.26%	
Non-available like these activities	2	0.42%	
<b>Answered question</b>	<b>478</b>		
<b>Skipped question</b>	<b>100</b>		
Do you know where to go if you want to participate in Charity Pharmacy at your work	Response Count	Response Percent	
Yes	243	42.26%	0.000
No	216	37.57%	
Uncertain	61	10.61%	
I do not know	55	9.57%	
<b>Answered question</b>	<b>575</b>		
<b>Skipped question</b>	<b>3</b>		
Do you know where to go if you want to participate in Charity Pharmacy OUTSIDE your work	Response Count	Response Percent	
Yes	259	44.97%	0.000
No	213	36.98%	
Uncertain	52	9.03%	
I do not know	52	9.03%	
<b>Answered question</b>	<b>576</b>		
<b>Skipped question</b>	<b>2</b>		

(years), academic qualifications, years of experience, and position held in a pharmacy career. Besides, information on pharmacy volunteering activities, Charity Pharmacy at inside work, and Charity Pharmacy at outside the job. The multiple regression analysis considered knowledge as the dependent variable and factors affecting it as an explanatory variable. There was a medium relationship ( $R=0.640$  with  $p=0.000$ ) between the knowledge of the pharmacy volunteer and its factors. Six out of eleven (location, worksite, age, knowledge of pharmacy volunteering activities, and knowledge of Charity Pharmacy outside the work.) were non-significant differences ( $p>0.05$ ). However, multiple regression analysis confirmed that five factors (i.e., gender, academic qualifications, years of experience, position, and knowledge of Charity Pharmacy at inside work) explained 17.6%, 31.6%, 21.6%, 13.4%, and 44.7%, respectively of the positive relationship to the variation in knowledge, with a statistically significant difference ( $p=0.000$ ), ( $p=0.000$ ), ( $p=0.000$ ), ( $p=0.001$ ), and ( $p=0.000$ ), respectively. Besides, one factor (i.e., Nationality) explained 12.4% of the negative relationship to the variation in knowledge, with a statistically significant difference ( $p=0.005$ ). The bootstrap model was also confirmed. Furthermore, the relationship was verified by the non-existence of multicollinearity with the Nationality, gender, academic qualifications, position, and knowledge of Charity Pharmacy at inside work factors with a Variance Inflation Factor (VIF) of 1.793, 1.724, 1.369, 2.425 and 1.870 respectively less than three or five as a sufficient number of VIF. Except experiences factors had 3.198, which existence of multicollinearity.<sup>21-23</sup> (Table 6).

### Factors affecting the knowledge of pharmacists about the type of charitable pharmaceutical care resources

Factors affecting the perception were analyzed. We adjusted the significant values using the independent samples Kruskal–Wallis test and the Bonferroni correction for multiple tests. **Knowledge of pharmacists about** the type of charitable pharmaceutical care resources includes Location, Site of work, **nationality**, Pharmacist gender, age (years), Academic qualifications, Years of experience in a pharmacy career, Position, knowledge of pharmacy volunteering activities, knowledge of Charity Pharmacy at inside work, and knowledge of Charity Pharmacy at outside work. Five locations affected pharmacists' knowledge **about the type of resources for** charitable pharmaceutical care. The Eastern region showed the lowest scores (2.4514), with statistically significant differences between regions ( $p=0.000$ ). Fourteen worksites affected pharmacists' knowledge **about the type of resources for** charitable pharmaceutical care. The non-MOH governmental sectors (including hospitals) and general medical directorate in the region obtain the lowest score (2.6477) and (2.8240), respectively, with a statistically significant difference between working sites ( $p=0.000$ ) with significance among all sites. The Saudi Nationality had the lowest score (3.4967) with

**Table 4: Pharmacist knowledge of the charity pharmacy practice.**

No	Items	Complete knowledge		Incomplete knowledge		Weak knowledge		I do not have the knowledge		I do not need this knowledge		Total	Weighted Average	p-value (X2)
1	Vision and mission of Charity Pharmacy	239	41.42%	125	21.66%	112	19.41%	69	11.96%	32	5.55%	577	3.81	0.000
2	Strategic plan of Charity Pharmacy	135	23.44%	226	39.24%	105	18.23%	76	13.19%	34	5.90%	576	3.61	0.000
3	Policy and Procedures of Charity Pharmacy	134	23.22%	130	22.53%	198	34.32%	77	13.34%	38	6.59%	577	3.42	0.000
4	Education and training of Charity Pharmacy	139	24.09%	128	22.18%	68	11.79%	203	35.18%	39	6.76%	577	3.22	0.000
5	competency of Charity Pharmacy	139	24.09%	155	26.86%	74	12.82%	78	13.52%	131	22.70%	577	3.16	0.000
	Answered question											577		
	Skipped question											1		



**Table 5: Type of charity pharmacy practice resources.**

No	Items	Complete knowledge		Incomplete knowledge		Weak knowledge		I do not have the knowledge		I do not need this knowledge		Total	Weighted Average	p-value (X2)
		%	n	%	n	%	n	%	n	%	n			
1	Governmental sector	27.35%	157	42.16%	242	12.02%	69	11.50%	66	6.97%	40	574	3.71	0.000
2	Private sector	11.27%	64	55.28%	314	12.50%	71	12.85%	73	8.10%	46	568	3.49	0.000
3	University sector	14.51%	82	55.58%	314	10.80%	61	11.50%	65	7.61%	43	565	3.58	0.000
4	General medical or health society	16.34%	92	52.58%	296	11.90%	67	11.90%	67	7.28%	41	563	3.59	0.000
5	Pharmacy societies or associations	11.68%	66	51.15%	289	16.11%	91	13.27%	75	7.79%	44	565	3.46	0.000
6	Public institutions	16.64%	94	45.13%	255	17.17%	97	13.45%	76	7.61%	43	565	3.5	0.000
7	Pharmacy manufacturers	16.04%	90	45.63%	256	16.22%	91	14.08%	79	8.02%	45	561	3.48	0.000
8	The Internet	18.90%	107	42.76%	242	16.78%	95	14.84%	84	6.71%	38	566	3.52	0.000
9	My friend	19.43%	110	41.52%	235	16.25%	92	16.08%	91	6.71%	38	566	3.51	0.000
10	Project management administration	15.58%	88	41.06%	232	17.52%	99	17.70%	100	8.14%	46	565	3.38	0.000
11	Social media	19.82%	112	42.65%	241	16.46%	93	13.81%	78	7.26%	41	565	3.54	0.000
	Answered question											577		
	Skipped question											1		

statistically significant and affected pharmacists' knowledge *about the type of* charitable pharmaceutical care *resources* ( $p=0.000$ ). The female gender score showed a higher score (3.6398) than the male (3.4532) of *knowledge of pharmacists about the type of* charitable pharmaceutical care *resource* with a statistically significant difference ( $p=0.000$ ). The responders' age affected pharmacists' knowledge *about the kind of* charitable pharmaceutical care *resources*. Pharmacists aged 45-54 scored the lowest (2.9021), with a statistically significant difference between all age groups ( $p=0.000$ ). Six academic qualifications affected pharmacists' knowledge *about the type of* charitable pharmaceutical care *resources*. The highest score (4.0026) was obtained with a residency degree, with a statistically significant difference between all levels ( $p=0.000$ ). Five levels of work experience affected pharmacists' knowledge *about the type of* charitable pharmaceutical care *resources*, with a statistically significant difference between all levels ( $p=0.000$ ). The lowest score (2.5074) was obtained for those with work experience of 11-15 years, with a statistically significant difference between all levels ( $p=0.000$ ). Seven levels of the position affected pharmacists' knowledge about the type of charity pharmacy practice resources. The lowest score (2.6767) was obtained for the pharmacy supervisor, with a statistically significant difference between all levels ( $p=0.000$ ). The presence of knowledge of pharmacy volunteering activities had the highest score (3.6649) and was statistically significant and affected pharmacists' knowledge *about the type of* charitable pharmaceutical care *resources* ( $p=0.001$ ). The presence of knowledge of Charity Pharmacy inside work had the highest score (3.8964), was statistically significant, and affected pharmacists' understanding *of the type of* charitable pharmaceutical care *resources* ( $p=0.000$ ). The presence of Charity Pharmacy at outside work had the highest score (4.1832), which was statistically significant and affected pharmacists' knowledge *about the type of* charitable pharmaceutical care *resources* ( $p=0.000$ ).

The relationship between pharmacists' knowledge *about* the type of charity pharmacy practice resources and factors was discussed. Such as location, worksite, nationality, gender, age (years), academic qualifications, years of experience, position held in a pharmacy career, knowledge of pharmacy volunteering activities, knowledge of Charity Pharmacy at inside work, and knowledge of Charity Pharmacy at outside the job. The multiple regression analysis considered perception as the dependent variable and factors affecting it as an explanatory variable.

There was a strong relationship ( $R=0.751$  with  $p=0.000$ ) between the knowledge of the type of charity pharmacy practice resources and its factors. Two out of eleven (Nationality and knowledge of Charity Pharmacy at inside work) were non-significant differences ( $p>0.05$ ). However, multiple regression analysis confirmed that four factors (i.e., worksite, gender, age, and academic qualifications) explained 9.20%, 8.30%, 14.5%, and 13.1%, respectively of the positive relationship to the variation in knowledge, with a statistically significant difference ( $p=0.009$ ), ( $p=0.026$ ), ( $p=0.005$ ), and ( $p=0.001$ ), respectively. Besides, five factors (i.e., location, experiences, position, knowledge of pharmacy volunteering activities, and knowledge of Charity Pharmacy outside the work) explained 19.7%, 23.9%, 33.3%, 28.7%, and 44.0% of the negative relationship to the variation in knowledge of the type of charity pharmacy practice resources, with a statistically significant difference ( $p=0.000$ ), ( $p=0.000$ ), ( $p=0.000$ ), ( $p=0.000$ ), and ( $p=0.000$ ) respectively. The bootstrap model was also confirmed. Furthermore, the relationship was verified by the non-existence of multicollinearity with the location, worksite, gender, academic qualifications, position held in a pharmacy career, knowledge of pharmacy volunteering activities, and knowledge of Charity Pharmacy at outside the work factors with a Variance Inflation Factor (VIF) of 1.322, 1.539, 1.719, 1.368, 1.417, 1.331, and 1.943 respectively less than three or five as an adequate number of VIF. Except for age and experience, factors had 3.274 and 3.166, respectively, which showed the existence of multicollinearity.<sup>21-23</sup> (Table 7).

## DISCUSSION

Over the past years, the pharmacist's job changed from serving medicine to serving patients.<sup>24,25</sup> Twenty years back, the descriptions of pharmacists were released as pharmaceutical care providers.<sup>24,25</sup> It was the first release in the pharmacy practice. The American Society of Health system pharmacists encouraged that job definition with more depth of explanation.<sup>24,25</sup> The pharmacist impact was documented at that time by preventing morbidity and mortality.<sup>26-32</sup> All those pharmacists got paid appropriate salaries. However, some poor people are not under health insurance coverage and cannot get paid for doctor diagnoses or drugs for disease management. Thus, various charitable societies paid the management cost on their behalf of them. The pharmacist is involved in the charitable organization without getting paid. In Saudi Arabia, over the past decades, many charitable organizations received

**Table 6: Multiple regression of Factors with the pharmacist's knowledge of the charity pharmacy practice.**

Model	R	R Square	F	Sig.	Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
					B	Std. Error			Lower Bound	Upper Bound	Tolerance	VIF
1	.640 <sup>b</sup>	.409	34.511	.000 <sup>b</sup>	-.171	.232	-.735	.463	-.627	.285		
					.001	.027	.019	.984	-.053	.054	.751	1.331
					.005	.018	.285	.776	-.030	.040	.650	1.538
					-.331	.117	-2.818	.005	-.561	-.100	.558	1.793
					.415	.102	4.072	.000	.215	.615	.580	1.724
					-.058	.054	-1.065	.287	-.164	.049	.303	3.304
					.210	.025	8.226	.000	.160	.260	.730	1.369
					.198	.054	3.685	.000	.092	.303	.313	3.198
					.089	.026	3.417	.001	.038	.141	.702	1.425
					.103	.086	1.197	.232	-.066	.273	.751	1.332
					.535	.054	9.953	.000	.429	.640	.535	1.870
					-.028	.056	-.499	.618	-.137	.082	.519	1.928

a. Dependent Variable: Pharmacist knowledge of the charity pharmacy practice, Predictors: (Constant), Location, Age (years), Pharmacist gender, Position Held, and Years of experience at pharmacy career, knowledge of pharmacy volunteering activities, knowledge of Charity Pharmacy at inside work, and knowledge of Charity Pharmacy at outside work

**Bootstrap for Coefficients**

Model	B	Bias	Std. Error	Sig. (2-tailed)	Bootstrap <sup>a</sup>		
					95% Confidence Interval	Lower	Upper
1	-.171	-.013	.207	.402	-.560	.237	
	.001	.002	.035	.987	-.065	.071	
	.005	.000	.021	.819	-.035	.047	
	-.331	-.001	.146	.021	-.602	-.035	
	.415	.006	.124	.003	.172	.670	
	-.058	.002	.068	.377	-.199	.075	
	.210	.000	.031	.001	.146	.271	
	.198	-.003	.066	.004	.063	.330	
	.089	.001	.036	.018	.021	.161	
	.103	-.002	.096	.292	-.097	.288	
	.535	.000	.067	.001	.409	.669	
	-.028	.001	.065	.682	-.160	.096	

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

**Table 7: Multiple regression of Factors with the knowledge about the type of charity pharmacy practice resources.**

Model	R	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
					B	Std. Error	Beta	Upper Bound			Lower Bound	Tolerance	VIF	
1	.751 <sup>b</sup>	.565	64.726	.000 <sup>b</sup>	5.751	.187			30.808	.000	5.384	6.118		
					-.133	.022	-.197		-6.077	.000	-.175	-.090	.756	1.322
					.037	.014	.092		2.631	.009	.009	.065	.650	1.539
					.152	.094	.061		1.615	.107	-.033	.338	.558	1.792
					.183	.082	.083		2.236	.026	.022	.343	.582	1.719
					.124	.043	.145		2.850	.005	.038	.209	.305	3.274
					.081	.020	.131		3.974	.000	.041	.121	.731	1.368
					-.204	.043	-.239		-4.761	.000	-.288	-.120	.316	3.166
					-.208	.021	-.333		-9.920	.000	-.249	-.167	.706	1.417
					-.612	.069	-.287		-8.836	.000	-.748	-.476	.751	1.331
					.011	.043	.010		.248	.804	-.074	.096	.531	1.884
					-.501	.045	-.440		-11.210	.000	-.589	-.413	.515	1.943

a. Dependent Variable: knowledge about the type of charity pharmacy practice resources, Predictors: (Constant), Location, Age (years), Pharmacist gender, Position Held, and Years of experience at pharmacy career, knowledge of pharmacy volunteering activities, knowledge of Charity Pharmacy at inside work, and knowledge of Charity Pharmacy at outside work. a. Dependent Variable: knowledge about the type of charity pharmacy practice resources, Predictors: (Constant), Location, Age (years), Pharmacist gender, Position Held, and Years of experience at pharmacy career, knowledge of pharmacy volunteering activities, knowledge of Charity Pharmacy at inside work, and knowledge of Charity Pharmacy at outside work.

Model	Bootstrap <sup>a</sup>				
	B	Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval
					Lower Upper
1	5.751	.001	.180	.001	5.393 6.120
	-.133	.001	.026	.001	-.182 -.082
	.037	-.001	.016	.023	.005 .068
	.152	-.002	.112	.167	-.062 .375
	.183	.004	.106	.090	-.016 .397
	.124	-.002	.041	.004	.043 .203
	.081	.000	.024	.003	.033 .131
	-.204	.003	.045	.001	-.297 -.109
	-.208	-.001	.021	.001	-.248 -.168
	-.612	.002	.078	.001	-.758 -.451
	.011	-.002	.046	.803	-.088 .099
	-.501	-.001	.044	.001	-.578 -.414

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

financial donations from wealthy people for low-income families through charitable contributions.<sup>5,33</sup> Charity organizations for healthcare activities were developed to cover the healthcare of low-income families and children inside and outside Saudi Arabia.<sup>33</sup> All healthcare providers are involved in charitable activities during mass gatherings and pandemic opportunities.<sup>4</sup> Pharmacists play active roles in charitable activities during various situations.<sup>5</sup> However, not all pharmacists participate in charitable organizations for unclear reasons. The exploration of pharmacist knowledge about charitable pharmaceuticals activities can answer the reasons. Thus, the current research demonstrates the pharmacist's knowledge of philanthropic activities in the pharmacy practice. The study included all pharmacists and pharmacy technicians with different locations, working sites, gender, ages, experiences, and working positions.

The findings showed that half of the responders were not familiar with charitable pharmacies and related activities because of inadequate awareness of charitable pharmaceutical care performance. Moreover, most philanthropic organizations on healthcare activities focus on physicians only. Thus, most pharmacists did not practice charitable pharmacy activities for various reasons. The most common sense is a lack of time, or they do not need it. Besides, they did not take any education back about charitable pharmaceuticals care or difficulty understanding charitable activities. That's expected because the pharmacist did not take any educational courses during pharmacy school and had a weak awareness of charitable work in the pharmacy practice. Charitable pharmaceutical care activities are new for most pharmacists, especially before Saudi vision 2030. The new Vision encourages charitable activities for all specialists, emphasizing healthcare practices. Thus, there is no previous investigation to compare with the current findings.

Various factors might affect the pharmacist's knowledge of charitable pharmaceutical care, such as the location with the lowest number of pharmacists in big cities who are busy with their job and do not have time to read or participate in charitable pharmaceuticals activities. But it will change in the future because of the Saudi vision implementation at healthcare facilities. The worksites might affect pharmacists' knowledge, with the slightest knowledge being general medical directorates and community pharmacies, because they do not have any opportunities for charitable activities. Gender might affect pharmacists' knowledge, especially since females were more knowledgeable due to more reading and participation than males in charitable activities in pharmacy practice. The young pharmacists and diploma qualifications had the lowest knowledge because the young professionals were not familiar with charitable activities, and pharmacy technicians did not mainly participate in charitable activities. The highly expert pharmacists understood charitable activities more because they might gain experience and read or join pharmaceutical societies or health care charitable organizations. In contrast, the manager position had the lowest knowledge of charitable pharmaceuticals activities due to being busy with administrative duties and not participating in charitable work. The most dependable factors that positively affected pharmacist knowledge of charitable activities were gender, academic qualifications, and positions, as explored before. In contrast, Nationality might negatively affect the pharmacist's knowledge, such non-Saudis not having joint participation in the charitable pharmaceuticals care works. Thus, there is no previous investigation to compare with the current findings.

The findings showed appropriate knowledge of surveyed elements of charitable work of pharmacy practice. The Vision and mission of charitable pharmaceuticals care were apparent, especially after the Saudi vision implementation. In contrast, the competency of charitable pharmacy was the lowest knowledge by pharmacists because it was not well established in the pharmaceutical field, emphasizing the lack of education in the charitable pharmacy. Most pharmacists used

the government sectors as sources of charitable work because they implemented the Saudi Vision and encouraged all pharmacy staff to be involved in charitable activities. Medical or health charitable societies followed them because they were established several years back, and some pharmacists are familiar with them adequately. In contrast, the charitable pharmacy society least resources for charitable pharmacy activities because of inadequate advertising to the public. Besides, the project management administration was the least resource for charitable activities because the administration did not advertise their philanthropic projects, nor were there clear benefits of pharmacists participating with them. Thus, there is no previous investigation to compare with the current findings.

Various factors might affect the knowledge of pharmaceutical care resources. Such as the location emphasis, the eastern area had the lowest knowledge by pharmacists because it might be the pharmacist not aware of related charitable activities or that there is no adequate advertising about charitable pharmaceuticals performances. The working site might affect the pharmacist's knowledge of resources, such non-Moh government sector general medical directorate, because there might not be offered charitable pharmaceuticals activities. Nationality might affect the understanding of resources. Such Saudis had the lowest knowledge because they might not read or practice charitable work in the pharmacy. The female pharmacist had more knowledge than charitable pharmacy resources due to more participation in the vulnerable workers. The age might affect the pharmacist's knowledge of resources, such as age 45-54 years, with experience 11-15 years, and pharmacy supervisors. That's related to inadequate reading and practicing charitable activities. The academic residency qualifications had higher knowledge of charitable activities because it might be part of their responsibility of training programs. The presence of knowledge of charitable pharmacy programs had more knowledge of charitable organization's resources than others. That's related to being more involved and reading about charitable foundations in the pharmacy practice. The most dependable factors positively affect the pharmacist's knowledge of charitable resources were working site, age, gender, and academic qualifications, as focused on earlier. In contrast, locations, experiences, positions, and knowledge of the presence of charitable activities might negatively affect charitable pharmaceutical resources, as explored before. Thus, there is no previous investigation to compare with the current findings.

### Limitations

Although the study showed several advantages. Such appropriate calculated sample size, various pharmacy sectors, and high-reliability results. However, it had multiple limitations that included randomized sampling methodology, which determines the prevalence of knowledge. Multiple variables without an equal sample from each variable cannot give all participants whole pictures. Future research with randomized techniques is warranted at different times to follow up on the improvement of the knowledge of the pharmacist.

### CONCLUSION

The current study assumed the first study had been done locally and in Arabic countries. The cross-sectional study with various subjects and high-reliability test. The knowledge of pharmacy professionals about charitable pharmaceutical care services was inadequate. The majority of pharmacy practitioners did not involve in charitable pharmacy practice. Most pharmacy professionals do not have time, feel did not need it, or lack education about charitable pharmacy practice. The pharmacy profession's knowledge of pharmacy volunteer's jobs and resources sectors of information was adequate, with variations in the information resources among all healthcare sectors. The charitable pharmacy work's education and training should start with the undergraduate stage and



follow up in practice to improve pharmacy providers' knowledge about charitable work in Saudi Arabia.

## ACKNOWLEDGEMENT

None.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## Funding

None

## Consent for Publications

Informed consent was obtained from all the participants

## Ethical Approval

This research was exempted from research and ethical committee or an Institutional Review Board (IRB) approval.

<https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts-2018/index.html>

## ABBREVIATIONS

**MOH:** Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **SPSS:** Statistical Package of Social Sciences; **JASP:** Jeffery's Amazing Statistics Program; **STROBE:** Strengthening the reporting of observational studies in epidemiology statement; **VIF:** Variance Inflation Factor.

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## REFERENCES

- Government of Saudi Arabia. Saudi Arabia vision. Vol. 2030 [internet]; 2016. Available from: [https://vision2030.gov.sa/sites/default/files/report/Saudi\\_Vision2030\\_EN\\_2017.pdf](https://vision2030.gov.sa/sites/default/files/report/Saudi_Vision2030_EN_2017.pdf).
- National center for nonprofit sector [internet] [cited Dec 14 2022]. Available from: <https://ncnp.gov.sa/ar>.
- Saudi Arabia's vision 2030. National Transformation Program; 2020. p. 2017.
- MOH volunteering system [internet] [cited Dec 14 2022]. Available from: <https://volunteer.srca.org.sa/#/en/home>.
- Alomi YA, Almasoudi AH. Charity pharmaceutical care services: a New Initiative Project in Saudi Arabia. *PTB Reports*. 2021;7(2):61-5. doi: 10.5530/PTB.2021.7.11.
- Oke TO. Primary health-care services with a functional ambulatory care clinical pharmacy in a low-income housing project clinic. *J Natl Med Assoc*. 1994;86(6):465-8. PMID 8078084.
- Saleem F, Hassali MA, Ibrahim ZS, Rasheedy AAL, Aljadhey H. Perceptions and attitudes of pharmacy students towards volunteering at health promotional programs: A cross-sectional study from Malaysia. *J Community Health*. 2015;40(2):285-90. doi: 10.1007/s10900-014-9930-y, PMID 25115271.
- Babeaux HPF, Hall LE, Seifert JL. Charitable pharmacy services: impact on patient-reported hospital use, medication access, and health status. *J Am Pharm Assoc*. 2015;55(1):59-66. doi: 10.1331/JAPhA.2015.14010.
- Mohammed D, Turner K, Funk K. Pharmacy student involvement in student-run free clinics in the United States. *Curr Pharm Teach Learn*. 2018;10(1):41-6. doi: 10.1016/j.cptl.2017.09.008, PMID 29248073.
- Glanville M, Brady R, Miller S. Operation Donate: defining the value of redispensing medications donated by individuals. *J Am Pharm Assoc* (2003). 2014;54(5):542-7. doi: 10.1331/JAPhA.2014.11101, PMID 25216885.
- Knight TG, Deal AM, Dusetzina SB, Muss HB, Choi SK, Bensen JT, et al. Financial toxicity adults with cancer adverse outcomes noncompliance. *J Oncol Pract*. 2018;14(11):e665-73. doi: 10.1200/JOP.
- Assemi M, Corelli RL, Ambrose PJ. Development needs of volunteer pharmacy practice preceptors. *Am J Pharm Educ*. 2011;75(1):10. doi: 10.5688/ajpe75110, PMID 21451762.
- Wiesner AM, Steinke DT, Vincent WR, Record KE, Smith KM. National survey of pharmacy services in free medical clinics. *J Am Pharm Assoc* (2003). 2010;50(1):45-51. doi: 10.1331/JAPhA.2010.09013, PMID 20097639.
- Elrggal ME, Karami NA, Rafea B, Alahmadi L, Al Shehri A, Alamoudi R, et al. Evaluation of preparedness of healthcare student volunteers against Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in Makkah, Saudi Arabia: a cross-sectional study. *Z Gesundh Wiss*. 2018 Dec 1;26(6):607-12. doi: 10.1007/s10389-018-0917-5, PMID 30533343.
- Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med*. 2013;35(2):121-6. doi: 10.4103/0253-7176.116232, PMID 24049221.
- Pourhoseingholi MA, Vahedi M, Rahimzadeh M. Sample size calculation in medical studies. *Gastroenterol Hepatol Bed Bench*. 2013;6(1):14-7. PMID 24834239.
- Ezhumalai G. How big a sample do I need require. *Ann SBV*. 2017;6(1):39-41.
- Johnson TP, Wislar JS. Response rates and nonresponse errors in surveys [internet]. *JAMA*. 2012;307(17):1805-6. doi: 10.1001/jama.2012.3532, PMID 22550194.
- von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *PLOS Med*. 2007;4(10):1623-7. doi: 10.1371/journal.pmed.0040296.
- Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for Reporting Observational Studies [internet]. Vol. 370; 2007. Available from: <http://www.thelancet.com>. Available from: <http://www.plosmedicine.org>.
- Liao D, Valliant R. Variance inflation factors in the analysis of complex survey data. *Surv Methodol*. 2012;38(1):53-62.
- Akinwande MO, Dikko HG, Samson A. Variance inflation factor: as a condition for the inclusion of suppressor variable(s) in regression analysis. *Open J Stat*. 2015;05(7):754-67. doi: 10.4236/ojs.2015.57075.
- Thompson CG, Kim RS, Aloe AM, Becker BJ. Extracting the variance inflation factor and other multicollinearity diagnostics from typical regression results. *Basic Appl Soc Psych*. 2017;39(2):81-90. doi: 10.1080/01973533.2016.1277529.
- AHSP. ASHP statement on pharmaceutical care. *Am J Hosp Pharm*. 1993;50(50):1720-3.
- American Society of Health System Pharmacists. ASHP guidelines on a standardized method for pharmaceutical care. *Am J Heal Pharm*. 1996;53(14):1713-6. doi: 10.1093/ajhp/53.14.1713.
- Alanazi AA, Alomi YA, Almaznai MM, Aldwihi M, Aloraifi IAK, Albusalih FA. Pharmacist's intervention and medication errors prevention at pediatrics, obstetrics and gynecology hospital in east Province, Saudi Arabia. *Int J Pharmacol Clin Sci*. 2019;8(2):122-8. doi: 10.5530/ijpcs.2019.8.21.
- Alomi1 YA, Fallatah AO, al-Shubaar N, Qohal AA, Alameer LY. The Clinical Outcomes of Pharmacist Interventions in Total Parenteral Nutrition services in Riyadh City, Saudi Arabia. *Int J Pharm Heal Sci*. 2019;2(2):135-40.
- Sabry NA, Abbassi MM. Impact of a clinical pharmacist in the general hospital: an Egyptian trial. *Pharmacol Pharm*. 2014;5(Jun):577-87.
- de Molino C GRC, Carnevale RC, Rodrigues AT, Visacri MB, Moriel P, Mazzola PG. Impact of pharmacist interventions on drug-related problems and laboratory markers in outpatients with human immunodeficiency virus infection. *Ther Clin Risk Manag*. 2014;10(1):631-9.
- Cunningham KJ. Analysis of clinical interventions and the impact of pediatric pharmacists on medication error prevention in a teaching hospital. *J Pediatr Pharmacol Ther*. 2012;17(4):365-73. doi: 10.5863/1551-6776-17.4.365, PMID 23413180.
- Bond CA, Raehl CL. Clinical pharmacy services, pharmacy staffing, and hospital mortality rates. *Pharmacotherapy*. 2007;27(4):481-93. doi: 10.1592/phco.27.4.481, PMID 17381374.
- Bond CA, Raehl CL, Franke T. Clinical pharmacy services and hospital mortality rates. *Pharmacotherapy*. 1999;19(5):556-64. doi: 10.1592/phco.19.5.556.31531, PMID 10331818.
- Salman K. Humanitarian Aid and Relief Center [internet] [cited Mar 29 2020]. Available from: <https://www.krelief.org/>.