Knowledge of Pharmacists about Health Insurance in Saudi Arabia

Yousef Ahmed Alomi*,
BSc. Pharm, MSc. Clin Pharm, BCPS, BCNSP, DiBA, CDE,
Critical Care Clinical Pharmacists, TPN Clinical Pharmacist, Freelancer Business Planner, Content Editor, and Data Analyst, Riyadh, SAUDI ARABIA.
Abdulaziz Saad Ali Alrobiea,
MBBS, SB-Surgy, JB, FACS, KITP(UGIT- Surgy), Consultant GS and UGIT- bariatric surgery Riyadh First Health Cluster King Saud Medical city, Riyadh, SAUDI ARABIA.
Shaimaa O Ahmadeen, Bsc. Pharm, MSc. Pharm.,
Scientific Evaluation Expert, Saudi Food and Drug Authority, Riyadh, SAUDI ARABIA.
Mohammad Abdullah Alghamdi, Bsc. Pharm, MSc. Pharm., Director of Pharmacy, Care National Hospital, Riyadh, SAUDI ARABIA.
Maha Hussein Almadany, Bsc. Pharm Health Care Quality Management Professional Diploma (HCQM), Pharmacy Quality department, King Salman bin Abdulaziz Medical City, Al Madina Al Monwarah, SAUDI ARABIA.
Abeer Hussin Almasoudi, BSc.Pharm, BCPS.,
Director, Administration of Research and Studies, Ministry of Health, Tabuk, SAUDI ARABIA.
Atheer Fahad Al-Aqile, Pharm D, College of Pharmacy, Taif University, Taif, SAUDI ARABIA.

Correspondence:
Dr. Yousef Ahmed Alomi, Bsc. Pharm, msc. Clin pharm, bcps, bCNSP, DiBA, CDE
Critical Care Clinical Pharmacists, TPN Clinical Pharmacist, Freelancer Business Planner, Content Editor and Data Analyst, P.O.BOX 100, Riyadh 11392, Riyadh, SAUDI ARABIA.

Phone no: +966 504417712
E-mail: yalomi@gmail.com

Received: 22-01-2022;
Accepted: 07-03-2022;

Access this article online
www.ijpcs.net
DOI: 10.5530/ijpcs.2022.11.14

ABSTRACT

Objectives: To explore the knowledge of pharmacists about health insurance in Saudi Arabia. **Materials and Methods:** It analyzes a cross-sectional survey that discussed Pharmacist knowledge of health insurance in Saudi Arabia. The survey consisted of respondents' demographic information about pharmacists, The health insurance assessment of primary and advanced knowledge, and The Resources used about the health insurance drug therapy. 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 the reliability of McDonald's ω, Cronbach alpha, Gutmann's λ2, and Gutmann's λ6 were done with the study. Furthermore, the data analysis of the Knowledge of Pharmacists about Health Insurance 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 398 pharmacists responded to the questionnaire. Of them, more than one-third responded from the Central region (137 (34.51%)), and one Quarter responded from the western part (109 (27.46%)), with statistically significant differences between the provinces (p=0.000). Males responded more than females (239 (60.35%)) versus 157 (39.65%)), with statistically significant differences between all levels (p=0.000). Most of the responders were in the age group of 24-30 years (271 (68.26%)) and 31-35 years (56 (14.11%)), with statistically significant differences between all age groups (p=0.000). Most of the pharmacists were staff pharmacists (300 (75.76%)) and pharmacy supervisors (43 (10.86%)), with statistically significant differences between all levels (p=0.000). Almost one-half of pharmacists currently have health insurance coverage (239 ((60.05%)) with equal or less than one year (108 ((42.52%)), or 2-3 years (81 ((31.89%)), have you been associated with your current insurance provider with statistically significant differences between all levels (p=0.000). The average score of basic knowledge of pharmacists about health insurance was (1.91). The element "the ethics used in health insurance pharmacist" obtained the highest score (2.19). The aspect "the health insurance system covered the medications errors sentinel event" (2.05). The average score of advanced knowledge of pharmacists about health insurance was (1.95). The element "the knowledge of medications covered by health insurance" obtained the highest score (2.38). The aspect "the knowledge of the medications devices and health insurance" was (2.17). The most resources used for Pharmacist and health insurance information were health practitioners 179 (46.25%) SFDA website 128 (33.07%). They were followed by Scientific literature 117 (30.23%) and Drug information resources (Lexi comp-drug information, Micromedex, Epocrates 101 (26.10%). **Conclusion:** The pharmacist's knowledge of health insurance was insufficient in Saudi Arabia. The Heath insurance pharmacy is in high demand for transformation plans with vision. Therefore, Targeting education and training during undergraduate and postgraduate studies is highly recommended in Saudi Arabia.

Keywords: Knowledge, Pharmacists, Health, Insurance, Saudi Arabia.

INTRODUCTION

Over several years of implementing Saudi vision 2030, healthcare strategic planning, and pharmaceutical care plan in Saudi Arabia,[1-3] There have been various outcome occurrences like moving toward Ambulatory care services more than inpatient healthcare services. Ambulatory care services had advantages over acute care services, including pharmaceutical care. It is less of an economic burden on the healthcare system, which was proposed several years back in pharmacy practice.[3-5] The supposed number of Ambulatory care prescribes increased while inpatient and acute prescriptions decreased.[3,5] Moreover, pharmacy health insurance had critical value in the health care system.[6-13] A new organization was approved and released by a corporate company by name health corporate component administration, and all medical clusters overall in Saudi Arabia as planned.[1,2] The health insurance center expected organized all Saudi citizens under coverage by corporate health companies with regulations of the Council of Cooperative Health Insurance.[1,2] Thus, all healthcare providers, including pharmacists, should be familiar with the healthcare insurance system. The Council of Cooperative Health Insurance organizes the healthcare insurance system. It is responsible for all regulations or policies, and procedures of the healthcare

insurance system in Saudi Arabia.[14-18] There are various diseases and their drug therapy covered by healthcare insurance, such as endocrinology, cardiovascular disease, and obstetrics and Gynecology diseases. Besides psychiatric illness and other chronic conditions.[14] All those medications coverage should be aware of all pharmacy staff emphasizing Insurance Drug Formulary (IDF).[15-19] Few studies have been conducted locally about pharmacy knowledge of health insurance systems emphasizing medications.[6,20-28] The authors are unfamiliar with any investigation conducted locally or in gulf countries or Arabia about the current topic. The objective of the present cross-sectional study is to assess the pharmacist knowledge of health insurance in Saudi Arabia

MATERIALS AND METHODS

It analyzes a cross-sectional survey discussing pharmacists' knowledge of health insurance 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, The health insurances assessment of primary and advanced knowledge, and The Resources used about the High risk or high-alert medications.[7-13,20-28] The 5-point Likert response scale system was used with closed-ended questions. According to the previous litterateur 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 10%. As a result, the sample size will equal 380-420 with a power of study of 80%.[29-31] The response rate required for the calculated sample size is at least 60-70 % and above.[31,32] The survey was distributed through social media of what's applications and telegram groups of 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 the reliability of McDonald's ω, Cronbach alpha, Gutmann's λ2, and Gutmann's λ6 were done with the study. The data analysis of pharmacist's knowledge about health insurance in Saudi Arabia 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, correlation analysis. Beside, inferential analysis of factors affecting pharmacists and The health insurances assessment of basic and advance knowledge 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.[33,34]

RESULTS

A total number of 398 pharmacists responded to the questionnaire. Of them, more than one-third responded from the Central region (137 (34.51%)), and one Quarter responded from the western part (109 (27.46%)), with statistically significant differences between the provinces (p=0.000). Most of the responders were from Ministry of Health Hospitals (96 (24.37%)), Pharmaceutical companies (87 (21.86%)), and community pharmacies (69 (17.34%)), with a statistically significant difference between working sites (p=0.000). Males responded more than females (239 (60.35%)) versus 157 (39.65%)), with statistically significant differences between all levels (p=0.000). Most of the responders were in the age group of 24-30 years (271 (68.26%)) and 31-35 years (56 (14.11%)), with statistically significant differences between all age groups (p=0.000). Most of the pharmacists were staff pharmacists (300 (75.76%)) and pharmacy supervisors (43 (10.86%)), with statistically significant differences between all levels (p=0.000). Most of the responders held Bachelor in pharmacy (192 (48.36%)) and Pharm D (146 (36.78%)). Most pharmacists had a work experience of 1-3 years (160 (40.20%)) and >1 year (104 (26.13%)), with a statistically significant difference between years of experience (p=0.000). Most pharmacists work at an outpatient pharmacy (79 ((23.58%)) and inpatient pharmacist (63 ((18.81%)). Almost one-half of pharmacists currently have health insurance coverage (239 ((60.05%)) with equal or less than one year (108 ((42.52%)), or 2-3 years (81 ((31.89%)), have you been associated with your current insurance provider with statistically significant differences between all levels (p=0.000). There was a medium positive correlation between age (years) and years of experience based on Kendall's tau_b (0.686) and Spearman's rho (0.753) correlation coefficients, with a statistically significant difference between the two factors (p<0.000). There was a medium positive correlation between age (years) and length of health insurance coverage based on Kendall's tau_b (0.482) and Spearman's rho (0.526) correlation coefficients, with a statistically significant difference between the two factors (p<0.000). There was a medium positive correlation between years of experience and length of health insurance coverage based on Kendall's tau_b (0.682) and Spearman's rho (0.733) 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 practice area based on Kendall's tau_b (0.514) and Spearman's rho (0.627) correlation coefficients, with a statistically significant difference between the two factors (p<0.000). There was a medium negative correlation between the site of work and who currently have health insurance coverage based on Kendall's tau_b (0.404) and Spearman's rho (0.461) correlation coefficients, with a statistically significant difference between the two factors (p<0.000) (Tables 1 and 2).

The average score of basic knowledge of pharmacists about health insurance was (1.91). The element "the ethics used in health insurance pharmacist" obtained the highest score (2.19). The aspect "the health insurance system covered the medications errors sentinel event" (2.05). In contrast, the lowest score obtained for the element "In Saudi Arabia, the health insurance pharmacist gets more salary than regular pharmacist" was (1.67). The score for the component "know the Health insurance pharmacist at pharmaceutical companies" was (1.76), with a statistically significant difference between the responses (p<0.000). All aspects of the basic knowledge of pharmacists about health insurance were statistically significant between responses (p<0.000) (Table 3). The average score of advanced knowledge of pharmacists about health insurance was (1.95). The element "the knowledge of medications covered by health insurance" obtained the highest score (2.38). The aspect "the knowledge of the medications devices and health insurance" was (2.17). In contrast, the lowest score for the element "the knowledge about the clinical Heath insurance pharmacist" was (1.79). The score for the element "the knowledge of the resources of Health insurance pharmacist " was (1.79), with a statistically significant difference between the responses (p<0.000). All aspects of the advanced knowledge of pharmacists about health insurance were statistically significant between responses (p<0.000) (Table 4). The most resources used for Pharmacist and health insurance information were Health practitioners 179 (46.25%), SFDA website 128 (33.07%). They were followed by Scientific literature 117 (30.23%) and Drug information resources (Lexi comp-drug information, Micromedex, Epocrates 101 (26.10%) (Table 5). The score for single-test reliability analysis of McDonald's ω was 0.973, Cronbach's α was 0.973, Gutmann's was λ2, 0.974, Gutmann's

Table 1: Demographic, social information.

Locations	Response Count	Response Percent	*p*-value (X2)
Central area	137	34.51%	0.000
North area	34	8.56%	
South area	59	14.86%	
East area	58	14.61%	
West area	109	27.46%	
Answered question	**397**		
Skipped question	**1**		
Site of work	**Response Count**	**Response Percent**	***p*-value (X2)**
MOH Hospitals	97	24.37%	0.000
Military hospitals	26	6.53%	
National Guard Hospital	18	4.52%	
Security forces hospitals	10	2.51%	
University Hospital	16	4.02%	
MOH primary care centers	6	1.51%	
Private hospitals	40	10.05%	
Private ambulatory care clinics	2	0.50%	
Private primary healthcare center	7	1.76%	
Community pharmacy	69	17.34%	
Pharmaceutical company	87	21.86%	
Heath insurance company	2	0.50%	
King Faisal Specialist Hospital and Research Center	4	1.01%	
Academia	5	1.26%	
SFDA	6	1.51%	
Not Employment	3	0.75%	
Answered question	**398**		
Skipped question	**0**		
Gender	**Response Count**	**Response Percent**	
Male	239	60.35%	0.000
Female	157	39.65%	
Answered question	**396**		
Skipped question	**2**		
Age	**Response Count**	**Response Percent**	
24-30	271	68.26%	0.000
31-35	56	14.11%	
36-40	37	9.32%	
41-45	10	2.52%	
46-50	9	2.27%	
> 50	14	3.53%	
Answered question	**397**		
Skipped question	**1**		

Table 2: Demographic, social information.

Pharmacist Qualifications	Response Count	Response Percent	*p*-value (X2)
Diploma in Pharmacy	25	6.30%	
Bachelor in Pharmacy	192	48.36%	
Master	50	12.59%	
Pharm D	146	36.78%	
Ph. D	16	4.03%	
PGY 1	3	0.76%	
PGY 2	3	0.76%	
PGY 3	2	0.50%	
Fellowship	3	0.76%	
Answered question	**397**		
Skipped question	**1**		
Position Held	**Response Count**	**Response Percent**	
Director of Pharmacy	31	7.83%	0.000
Assistant Director of Pharmacy	22	5.56%	
Supervisor	43	10.86%	
Pharmacy staff	300	75.76%	
Answered question	**396**		
Skipped question	**2**		
Years of experience in a pharmacy career	**Response Count**	**Response Percent**	
Less than one year	104	26.13%	0.000
1-3	160	40.20%	
4-6	48	12.06%	
7-9	28	7.04%	
10-12	22	5.53%	
>12	36	9.05%	
Answered question	**398**		
Skipped question	**0**		
The practice area	**Response Count**	**Response Percent**	
Inpatient Pharmacy	63	18.81%	0.000
Outpatient Pharmacy	79	23.58%	
Satellite Pharmacy	6	1.79%	
Narcotics and Controlled	6	1.79%	
Extemporaneous Preparation	2	0.60%	
Clinical Pharmacy	21	6.27%	
Inventory Control	8	2.39%	
Drug Information	8	2.39%	
IV admixture	5	1.49%	
Community pharmacy	52	15.52%	
Health insurance	0	0.00%	
Medical representatives	57	17.01%	
Education and training	1	0.30%	
Pharmaceutical companies	13	3.88%	
Research and development	5	1.49%	

Continued...

Table 2: Cont'd.

The practice area	Response Count	Response Percent	
Quality management	3	0.90%	
Pharmacy administration	4	1.19%	
community pharmacy	2	0.60%	
Answered question	**335**		
Skipped question	**63**		
Do you currently have health insurance coverage?	**Response Count**	**Response Percent**	
Yes	239	60.05%	0.000
No	159	39.95%	
Answered question	**398**		
Skipped question	**0**		
If Yes, How long have you been associated with your current insurance provider?	**Response Count**	**Response Percent**	
< 1 year	108	42.52%	0.000
2-3	81	31.89%	
4-6	26	10.24%	
7-9	15	5.91%	
9-12	9	3.54%	
> 12	15	5.91%	
Answered question	**254**		
Skipped question	**144**		

λ6 was 0.981, and Greater Lower Bound was 0.989 with statistically significant (p<0.05).

Factors affecting the basic knowledge of pharmacists about health insurance

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. Pharmacists' basic knowledge of pharmacists about high-risk medications includes location, worksite, age (years), gender, position held, years of experience, practice area in a pharmacy career, Health insurance coverage, and Years of Health insurance coverage. Five locations affected basic knowledge of health insurance with statistically significant differences between regions (p=0.013) with a non-significant difference among all five areas. Sixteen worksites affected the basic understanding of health insurance. The working site affected the factors of fundamental knowledge with a statistically significant difference between working sites (p=0.011) without any significant difference among all working sites. The responders' age affected the pharmacist's basic knowledge of health insurance with statistically significant differences (p=0.006). There is a non-significant difference among all age levels. Gender did not affect the basic knowledge of health insurance, with non-significant differences between males and females (p=0.245). Six levels of work experience non-affected basic knowledge of health insurance with non-significant differences (p=0.165). Four levels of the position held were affected with the lowest score (1.7909) and (1.8056) by pharmacy staff and director of the pharmacy, respectively, with statistically significant differences between all levels (p=0.000). The pharmacy practice affected basic knowledge of health insurance with statistically significant differences between them (p=0.000), with the lowest score with pharmacy quality management (1.0000) with statistically significant difference (p<0.05). The present health insurance coverage for pharmacists did not affect the basic knowledge of health insurance with non-statically significant differences (p=0.107). The number of years of health coverage affected the basic knowledge of health insurance with statistically significant differences (p=0.029) with non-significant differences among all years levels (p>0.05).

The relationship between the basic knowledge of pharmacists about health insurance and factors such as location, worksite, age (years), gender, position held, years of experience, practice area in a pharmacy career, Health insurance coverage, and Years of Health insurance coverage. The multiple regression analysis considered perception as the dependent variable and factors affecting it as an expletory variable. There was a medium relationship (R=0.433 with p=0.000) between the basic knowledge of pharmacists about health insurance and its factors. Seven out of nine were non-significant differences (p>0.05). However, multiple regression analysis confirmed that two factors (i.e., working site and presence of Health insurance coverage) explained 45.0 % and 16.9%, respectively, of the negative relationship to the variation in knowledge, with a statistically significant difference (p=0.000) and (p=0.015), respectively. The bootstrap model was also confirmed. Furthermore, the relationship was verified by the non-existence of multicollinearity with a variance inflation factor (VIF) of 2.398 and 1.198, respectively, less than three or five as a sufficient number of VIF (Table 6).[35-37]

Factors affecting the advanced knowledge of pharmacists about health insurance

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. Pharmacists' advanced knowledge of pharmacists about *health insurance* includes location, worksite, age (years), gender, position held, years of experience, practice area in a pharmacy career, Health insurance coverage, and Years of Health insurance coverage. Five locations affected advanced knowledge of health insurance with statistically significant differences between regions (p=0.002) and non-significant differences among all five areas. Sixteen worksites did not affect the advanced knowledge of health insurance with non-statistically significant differences (p>0.05). The working site affected the factors of advanced knowledge with a statistically significant difference between working sites (p=0.035) with the highest score (2.8231) at security forecasts hospital (p<0.05). The age of the responders affected the pharmacist's advanced knowledge of health insurance with statistically significant differences (p=0.006) with the lowest score (1.6928) of age > 50 years. Gender did not affect the basic knowledge of health insurance, with non-significant differences between males and females (p=0.653). Six levels of work experience affected advanced knowledge of health insurance with significant differences (p=0.005), with the lowest score (1.6210) with age > 12 years old. Four levels of the position were affected, with the highest score (2.9388) by the assistant director of pharmacy, with a statistically significant difference between all levels (p=0.000).

The pharmacy practice affected the basic knowledge of health insurance with statistically significant differences (p=0.046) with non-statistically significant differences between them (p>0.05).

Table 3: Pharmacist and health insurance assessment of knowledge.

No	Items	There is no information		Little knowledge		Partial knowledge		Incomplete knowledge		Complete knowledge		Total	Weighted Average	*p*-value (X2)
1	Have you ever heard about the concept of a health insurance pharmacist?	187	47.10%	109	27.46%	62	15.62%	24	6.05%	15	3.78%	397	1.92	0.000
2	Have you ever heard about the concept of a health insurance pharmacist job?	198	49.87%	92	23.17%	58	14.61%	32	8.06%	17	4.28%	397	1.94	0.000
3	In Saudi Arabia, is there a Medication Error or medication safety or patient safety center covered by health insurance?	192	48.24%	91	22.86%	69	17.34%	32	8.04%	14	3.52%	398	1.96	0.000
4	Do you know the severity classification for Medications Errors (MEs) and Heath insurance coverage according to the severity classification?	185	46.72%	87	21.97%	75	18.94%	34	8.59%	15	3.79%	396	2.01	0.000
5	Do you know the system of Heath insurance medication errors sentinel events?	180	45.23%	101	25.38%	57	14.32%	37	9.30%	23	5.78%	398	2.05	0.000
6	Do you know the health insurance and narcotics, and controlled medication coverage?	207	52.01%	81	20.35%	57	14.32%	38	9.55%	15	3.77%	398	1.93	0.000
7	Do you know the ethics used by health insurance pharmacists?	170	42.71%	80	20.10%	79	19.85%	40	10.05%	29	7.29%	398	2.19	0.000
8	Do you know the job description of a health insurance pharmacist?	211	53.28%	81	20.45%	71	17.93%	28	7.07%	5	1.26%	396	1.83	0.000
9	In Saudi Arabia, the health insurance pharmacist gets more salary than the regular pharmacist	261	65.58%	53	13.32%	49	12.31%	24	6.03%	11	2.76%	398	1.67	0.000
10	Do you know the role of the pharmacist in health insurance companies?	194	49.24%	93	23.60%	69	17.51%	29	7.36%	9	2.28%	394	1.90	0.000
11	Do you know the role of Heath insurance pharmacists in healthcare institutions?	208	52.26%	90	22.61%	62	15.58%	23	5.78%	15	3.77%	398	1.86	0.000
12	Do you know the Heath insurance pharmacist at pharmaceutical companies?	232	58.59%	71	17.93%	58	14.65%	27	6.82%	8	2.02%	396	1.76	0.000
13	Do you know the patent or generic medications and health insurance?	221	55.67%	74	18.64%	68	17.13%	24	6.05%	10	2.52%	397	1.81	0.000
	Answered											**398**		
	Skipped											**0**		

In addition, the presence of health insurance coverage for pharmacists affected the basic knowledge of health insurance with statistically significant differences between them (p=0.000) with the highest score (2.0659) of present health insurance coverage. Finally, the number of years of health coverage affected the basic knowledge of health insurance with statistically significant differences (p=0.005) with non-significant differences among all years levels (p>0.05).

The relationship between the advanced knowledge of pharmacists about health insurance and factors such as location, worksite, age (years), gender, position held, years of experience, practice area in a pharmacy career, Health insurance coverage, and Years of Health insurance coverage. The multiple regression analysis considered perception as the dependent variable and factors affecting it as an expletory variable. There was a medium relationship (R=0.404 with p=0.000) between the advanced knowledge of pharmacists about health insurance and its factors. Seven out of nine were non-significant differences (p>0.05). However, multiple regression analysis confirmed that one factor (i.e., working site) explained 37.3 % of the negative relationship to the variation in knowledge, with a statistically significant difference (p=0.000). The bootstrap model was also confirmed. Furthermore, the relationship was verified by the non-existence of multicollinearity with a variance inflation factor (VIF) of 2.398, less than three or five as a sufficient number of VIF (Table 7).[35-37]

DISCUSSION

Healthcare insurance is expanding and updating the regulations more frequently in the kingdom of Saudi Arabia.[14-18] The laws start from simple coverage to more coverage of common medical diseases and surgeries.[14-18] Thus, more medicines are covered by health insurance with advanced medications and various indications.[15-19] Therefore, the pharmacist's knowledge of the health insurance system and regulations is necessary. Thus, the cross-sectional study about pharmacist's understanding of health insurance. It is done through a calculated sample size, with high reliability of the questionnaires and convenience sampling techniques which are better than the previous study[28] and almost similar to other research.[22] The study involved the various locations, working sites, age levels, experiences, and positions. That's reflected in the pharmacy society. The average basic knowledge of health insurance was poor. Most pharmacists are familiar with the ethics of Heath insurance and medication error sentinel events. That's reflected in elementary

Table 4: Heath insurance pharmacist assessment of advanced knowledge.

No	Items	There is no information		Little knowledge		Partial knowledge		Incomplete knowledge		Complete knowledge		Total	Weighted Average	*p*-value (X2)
1	Do you know medications covered by health insurance	125	31.41%	99	24.87%	94	23.62%	56	14.07%	24	6.03%	398	2.38	0.000
2	Do you know the adverse drug reactions and health insurance?	190	48.22%	82	20.81%	66	16.75%	39	9.90%	17	4.31%	394	2.01	0.000
3	Do you know the Medication errors and health insurance?	179	44.97%	82	20.60%	84	21.11%	29	7.29%	24	6.03%	398	2.09	0.000
4	Do you know the medications, devices, and health insurance?	159	40.05%	99	24.94%	77	19.40%	38	9.57%	24	6.05%	397	2.17	0.000
5	Do you know about food supplements and health insurance coverage?	180	45.23%	85	21.36%	83	20.85%	27	6.78%	23	5.78%	398	2.07	0.000
6	Do you know about Herbal medicine and health insurance?	192	48.61%	88	22.28%	66	16.71%	27	6.84%	22	5.57%	395	1.98	0.000
7	Do you know the international guidelines for health insurance pharmacists?	229	57.68%	56	14.11%	73	18.39%	27	6.80%	12	3.02%	397	1.83	0.000
8	Do you know the clinical Heath insurance pharmacist?	226	57.07%	74	18.69%	58	14.65%	30	7.58%	8	2.02%	396	1.79	0.000
9	Do you know the health insurance and off-labeled or non-approved medications?	214	53.77%	75	18.84%	67	16.83%	27	6.78%	15	3.77%	398	1.88	0.000
10	Do you know Heath insurance and poisoning?	216	54.27%	81	20.35%	54	13.57%	35	8.79%	12	3.02%	398	1.86	0.000
11	Do you know the resources of Heath insurance pharmacists	231	58.19%	74	18.64%	52	13.10%	24	6.05%	16	4.03%	397	1.79	0.000
12	Do you know the antineoplastic medications and health insurance?	211	53.02%	74	18.59%	66	16.58%	31	7.79%	16	4.02%	398	1.91	0.000
13	Do you know the radiopharmaceutical products and health insurance?	227	57.32%	73	18.43%	53	13.38%	31	7.83%	12	3.03%	396	1.81	0.000
14	Do you know the high-risk medications and Heath insurance?	216	54.55%	81	20.45%	54	13.64%	35	8.84%	10	2.53%	396	1.84	0.000
	Answered											**398**		
	Skipped											**0**		

Table 5: The Resources used about the Pharmacist and health insurance sources.

NO		Responses	
1.	Health practitioners	179	46.25%
2.	Scientific literature	117	30.23%
3.	Peer discussions	84	21.71%
4.	Medical association literature/guidelines/recommendations	73	18.86%
5.	Drug information resources (Lexi comp-drug information, Micromedex, Epocrates ..etc	101	26.10%
6.	SFDA website	128	33.07%
7.	Drug Bulletin	41	10.59%
8.	Relatives and friends	57	14.73%
9.	Medication errors education courses	48	12.40%
10.	Internet	98	25.32%
11.	The drug information center at the hospital	56	14.47%
12.	Awareness lectures in a hospital	45	11.63%
13.	Awareness lectures at the primary healthcare center	22	5.68%
14.	Healthcare care awareness events at the market	18	4.65%
15.	Health insurance companies	98	25.32%
16.	Pharmaceutical companies	87	22.48%
	Answered	**387**	
	Skipped	**11**	

Table 6: Multiple regression of Factors with the pharmacist's basic knowledge of health insurance.

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)	.433 [b]	.187	5.272	.000[b]	3.529	.544		6.484	.000	2.456	4.602		
	Location					.037	.034	.071	1.095	.275	-.030	.105	.942	1.062
	Site of work					-.109	.024	-.450	-4.631	.000	-.156	-.063	.417	2.398
	Age (years)					.160	.099	.178	1.618	.107	-.035	.354	.325	3.079
	Pharmacist gender					-.123	.119	-.068	-1.035	.302	-.356	.111	.924	1.082
	Years of experience in a pharmacy career					.040	.094	.055	.425	.671	-.146	.226	.233	4.299
	Position Held					-.033	.063	-.036	-.516	.606	-.158	.092	.804	1.244
	Practice area					.018	.017	.102	1.082	.281	-.015	.051	.447	2.238
	The presence of Health insurance coverage					-.796	.323	-.169	-2.460	.015	-1.433	-.158	.834	1.198
	Years of Health insurance coverage					-.082	.060	-.129	-1.366	.174	-.201	.036	.441	2.267

a. Dependent Variable: pharmacist's basic knowledge of health insurance, Predictors: (Constant), Location, Age (years), Pharmacist gender, Position Held, Years of experience in a pharmacy career, practice area, The presence of Health insurance coverage, Years of Health insurance coverage.

Bootstrap for Coefficients							
Model		B	Bias	Bootstrap[a]			
				Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	3.529	-.036	.559	.001	2.351	4.568
	Location	.037	-.001	.038	.324	-.039	.112
	Site of work	-.109	.001	.019	.001	-.146	-.072
	Age (years)	.160	.006	.091	.075	-.017	.344
	Pharmacist gender	-.123	-.008	.113	.291	-.357	.093
	Years of experience in a pharmacy career	.040	-.002	.087	.633	-.131	.207
	Position Held	-.033	.000	.072	.639	-.182	.094
	Practice area	.018	.000	.015	.225	-.010	.050
	Health insurance coverage	-.796	.033	.347	.015	-1.393	-.033
	Years of Health insurance coverage	-.082	.002	.055	.126	-.180	.034

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

Table 7: Multiple regression of Factors with the pharmacist's advanced knowledge of health insurance.

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)	.404 [b]	.163	4.453	.000[b]	3.403	.557		6.114	.000	2.306	4.501		
	Location					.011	.035	.020	.306	.760	-.058	.080	.942	1.062
	Site of work					-.091	.024	-.373	-3.780	.000	-.139	-.044	.417	2.398
	Age (years)					.128	.101	.142	1.273	.204	-.070	.327	.325	3.079
	Pharmacist gender					-.138	.121	-.075	-1.135	.258	-.376	.101	.924	1.082
	Years of experience in a pharmacy career					.046	.097	.062	.472	.638	-.145	.236	.233	4.299
	Position Held					-.070	.065	-.076	-1.072	.285	-.197	.058	.804	1.244
	Practice area					.009	.017	.048	.499	.619	-.025	.043	.447	2.238
	The presence of Health insurance coverage					-.460	.331	-.097	-1.391	.166	-1.112	.192	.834	1.198
	Years of Health insurance coverage					-.056	.062	-.088	-.912	.363	-.178	.065	.441	2.267

a. Dependent Variable: pharmacist's advanced knowledge of health insurance, Predictors: (Constant), Location, Age (years), Pharmacist gender, Position Held, Years of experience in a pharmacy career, practice area, The presence of Health insurance coverage, Years of Health insurance coverage

Bootstrap for Coefficients							
Model		B	Bias	Bootstrap[a]			
				Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	3.529	-.036	.559	.001	2.351	4.568
	Location	.037	-.001	.038	.324	-.039	.112
	Site of work	-.109	.001	.019	.001	-.146	-.072
	Age (years)	.160	.006	.091	.075	-.017	.344
	Pharmacist gender	-.123	-.008	.113	.291	-.357	.093
	Years of experience in a pharmacy career	.040	-.002	.087	.633	-.131	.207
	Position Held	-.033	.000	.072	.639	-.182	.094
	Practice area	.018	.000	.015	.225	-.010	.050
	Health insurance coverage	-.796	.033	.347	.015	-1.393	-.033
	Years of Health insurance coverage	-.082	.002	.055	.126	-.180	.034

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

and essential information about insurance in pharmacy practice. In contrast, the pharmacist is not familiar with health insurance pharmacist salary and how the pharmaceutical companies relate coverage by health insurance, and what the processes to include in health insurance coverage through the Council of Cooperative Health Insurance.[14-19] Moreover, the pharmacist had inadequate knowledge about narcotics medicine and health insurance, the role of a pharmacist at health insurance companies, the patent and generic medicines coverage by Heath insurance, and the job description of a health insurance pharmacist. All those topics are essential in the healthcare system and for any pharmacist in the health insurance companies.[14-19] Thus, there is no previous investigation to compare with the current findings.

Various factors might affect the pharmacist's basic knowledge of health insurance; the location with the highest score was the central region. That is because most private and developed healthcare facilities are located on the working site, and other factors are because higher progressive healthcare organizations have more developed Heath insurance systems. In addition, the pharmacy staff and director of the pharmacy had a score of knowledge of health insurance because both of them properly not implemented of Heath insurance system in their organizations. The practice area that might affect the knowledge of health insurance with the lowest knowledge was pharmacy quality management, that's expected because most quality management personnel did not implement pharmacy Health insurance. The presence of health insurance coverage will not affect the pharmacist's knowledge. In contrast, the length of coverage affected the pharmacist's knowledge, that's expected because, with time, the pharmacist got more knowledge and experience with pharmacy health insurance. Finally, the most dependable factor was the working site with a negative variable in pharmacy health insurance. Thus, there is no previous investigation to compare with the current findings.

The findings in the current report showed poor pharmacists advanced knowledge of health insurance was poor. Most respondents were familiar with medications and device coverage by Health insurance. That's expected because most responders are from MOH hospitals and community pharmacies. They have a list of medicines that are covered by Health insurance. In contact, the pharmacist is unfamiliar with clinical health insurance pharmacists and their role and pharmacy health insurance resources. That's expected because the pharmacist does not correctly discuss the topic during pharmacy school, and any pharmaceutical society does not define the role of clinical pharmacists in Health insurance in Saudi Arabia. Most pharmacists used healthcare professionals and SFDA resources for pharmacy health insurance. That's related to currently the best resource pharmacy health insurance. Other regular drug information resources did not include pharmacy health insurance in the United States of America and Saudi Arabia, or other countries. Moreover, some essential elements of health insurance items it was necessary. For instance, health insurance, adverse drug reactions, food supplements, and health insurance, with herbal medicine and health insurance. In addition to drug poisoning, health insurance, off-labeled indications, and Heath insurance. The pharmacist had poor knowledge of them. That's related to inadequate education or non-practice of health insurance. Thus, there is no previous investigation to compare with the current findings.

Various factors affected the pharmacist's advanced knowledge of health insurance in such locations. Each region with high exposure to Heath insurance companies is more knowledgeable of the pharmacist. Other factors that affected the knowledge was working sites like security forces hospital highest score of knowledge of health insurance system because of more developed system at their sites. The age might affect the knowledge of health insurance, with the lowest knowledge of age more than 50 years old because the old pharmacist generation had limited experience with health insurance and did not discuss it during the school of pharmacy. The expertise might affect the advanced knowledge of health insurance; the experience of more than 12 years had the lowest knowledge because health insurance is almost new for them. In addition, the position might affect the advanced knowledge of pharmacists, such as assistant director having the highest knowledge compared with other positions. That's related to how the assistant director takes care of health insurance in the pharmacy department. Finally, the presence of health insurance and length of coverage of Heath insurance might increase the advanced knowledge of health insurance. That's expected because they are much deal with health insurance. Thus, there is no previous investigation to compare with the current findings.

Limitation

The current investigation contained a comprehensive analysis of pharmacy health insurance services. However, it had various limitations; such sampling methods were randomized and selected with non-equal subjects from each working site or location or the demographic data of the responders. Therefore, future investigations to avoid any limitations in the future are highly recommended to implement.

CONCLUSION

The knowledge of pharmacists about Heath insurance system was insufficient. Most pharmacists were familiar with sentinel drug-related problems and medications with their devices covered by Heath insurance regulations. In contrast, the pharmacist is unfamiliar with the pharmacist's role in Heath insurance services or related job descriptions and international guidelines of Heath insurance pharmacists. Besides, therapeutics guidelines, unapproved indications, and some medications such as oncology drugs, herbal medicines, and pharmacy health insurance. Various factors might affect pharmacist knowledge about Heath insurance services, such as work sites and Heath insurance coverage. Targeting revision and standardization of pharmacy Heath insurance services are highly recommended. Besides, undergraduate and undergraduate education and training in Heath insurance in pharmacy practice are highly suggested 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

IDF: Insurance Drug Formulary; **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.

ORCID ID

Yousef Ahmed Alomi https://orcid.org/0000-0003-1381-628X

REFERENCES

1. Government of Saudi Arabia. Saudi Arabia Vision 2030 [Internet]. 2016. Available from: https://vision2030.gov.sa/sites/default/files/report/Saudi_Vision2030_EN_2017.pdf
2. Saudi Arabia's Vision 2030. National Transformation Program 2020. 2017.
3. Alomi YA. New Pharmacy Model for Vision 2030 in Saudi Arabia. J Pharm Pract Community Med. 2017;3(3).
4. Almoajel A, Al-Salem A, LA-G-AJ of, 2016 undefined. The Quality of Home Healthcare Service in Riyadh/Saudi Arabia. AjscLeena-LunaCoJp [Internet]. 2016;5(2). Available from: http://www.ajsc.leena-luna.co.jp/AJSCPDFs/Vol.5(2)/AJSC2016(5.2-08).pdf
5. Wang Y, Jiang Y, Li Y, Wang X, Ma C, Ma S. Health insurance utilization and its impact: Observations from the middle-aged and elderly in China. PLoS One. 2013;8(12).
6. Epstein RS. Pharmacy benefit managers: Evaluating clinical utility in the real world. Clin Pharmacol Ther. 2010;88(6):880-2.
7. Levy H, Meltzer D. The impact of health insurance on health. In: Annual Review of Public Health. Annual Reviews. 2008:399-409.
8. Lyles A. Pharmacy Benefit Management Companies: Do They Create Value in the US Healthcare System? Pharmacoeconomics. 2017;35(5):493-500.
9. Jackson DL, Michaels NM, Melson B, Bruder E, Rhodes LA, Marciniak MW. Evaluation of the economic and clinical impact of community pharmacist-driven pharmacy benefit management services. J Am Pharm Assoc. 2019;59(4):S91-4.
10. Shrank WH, Porter ME, Jain SH, Choudhry NK. A blueprint for pharmacy benefit managers to increase value. American Journal of Managed Care. 2009;15:87-93.
11. Lipton HL, Kreling DH, Collins T, Hertz KC. Pharmacy benefit management companies: Dimensions of performance [Internet]. Annual Review of Public Health. 1999;20:361-401. Available from: www.annualreviews.org
12. Olson BM. Approaches to pharmacy benefit management and the impact of consumer cost sharing. Clinical Therapeutics. 2003;25:250-72.
13. Taniguchi R. Pharmacy benefit management companies [Internet]. American Journal of Health-System Pharmacy. 1995;52:1915-7. Available from: https://academic.oup.com/ajhp/article-abstract/52/17/1915/5094061
14. Council of Health Insurance. Council of Health BC [Internet]. Council of Health Insurance. 2022 [cited 2022 Nov 28]. Available from: https://chi.gov.sa/en/AboutCCHI/Pages/secretariat.aspx
15. Council of Cooperative Health Insurance. Implementing Regulations of the Cooperative Health Insurance Law [Internet]. Saudi Arabia. 2013. Available from: https://www.cchi.gov.sa/en/AboutCCHI/Rules/document/Implementing Regulations of the Cooperative Health Insurance Law.pdf
16. Council of cooperative health insurance. Cooperative Health Insurance Policy [Internet]. Council of cooperative health insurance. 2018. Available from: https://www.cchi.gov.sa/en/AboutCCHI/Rules/document/Cooperative Health Insurance Policy Approved.pdf
17. Council of cooperative health insurance. Private Health Insurance Sector Conduct Policy (Fraud, Waste, and Abuse) [Internet]. 2021. Available from: https://www.cchi.gov.sa/en/AboutCCHI/Rules/document/Private Health Insurance Sector Conduct Policy.pdf
18. Council of Cooperative Health Insurance. Health Insurance Beneficiaries Rights [Internet]. 2021. Available from: https://www.cchi.gov.sa/en/AboutCCHI/Rules/document/Health Insurance Beneficiaries Rights
19. Council of Cooperative Health Insurance. Insurance Drug Formulary (IDF) [Internet]. Council of Cooperative Health Insurance. 2022 [cited 2022 Nov 28]. Available from: https://chi.gov.sa/AboutCCHI/CCHIprograms/Pages/IDF.aspx
20. Boudreaux MH, Call KT, Turner J, Fried B, O'Hara B. Measurement Error in Public Health Insurance Reporting in the American Community Survey: Evidence from Record Linkage. In: Health Services Research. Blackwell Publishing Inc. 2015;1973-95.
21. Kondo A, Shigeoka H. Effects of universal health insurance on health care utilization, and supply-side responses: Evidence from Japan. J Public Econ. 2013;99:1-23.
22. Tseng YT, Chang EH, Kuo LN, Shen WC, Bai KJ, Wang CC, *et al*. Preliminary physician and pharmacist survey of the National Health Insurance PharmaCloud system in Taiwan. Comput Methods Programs Biomed. 2017;149:69-77.
23. Merrill BS, Tak CR, Feehan M, Munger MA. Payers' Perspectives on Pharmacist-Directed Care in a Community Pharmacy Setting. Ann Pharmacother. 2019;53(9):916-21.
24. Andrus MR, Forrester JB, Germain KE, Eiland LS. Accuracy of Pharmacy Benefits Manager Medication Formularies in an Electronic Health Record System and the Epocrates Mobile Application [Internet]. JMCP Journal of Managed Care and Specialty Pharmacy. 2015;21. Available from: http://www.
25. Lo B, Alpers A. Uses and Abuses of Prescription Drug Information in Pharmacy Benefits Management Programs [Internet]. Available from: http://jama.jamanetwork.com/
26. Nair V, Salmon JW, Kaul AF. Iatrogenic disease management: Moderating medication errors and risks in a pharmacy benefit management environment. Dis Manag. 2007;10(6):337-46.
27. Tungol A, Starner CI, Gunderson BW, Schafer JA, Qiu Y, Gleason PP. Generic drug discount programs: Are prescriptions being submitted for pharmacy benefit adjudication? J Manag Care Pharm [Internet]. 2012;18(9 A):690-700. Available from: www.amcp.org
28. Bawazir SA, Alkudsi MA, Al Humaidan AS, Al Jaser MA, Sasich LD. Pharmaceutical policies used by private health insurance companies in Saudi Arabia. Saudi Pharm J [Internet]. 2013;21(3):267-76. Available from: http://dx.doi.org/10.1016/j.jsps.2012.10.005
29. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? Indian Journal of Psychological Medicine. 2013;35:121-6.
30. Pourhoseingholi MA, Vahedi M, Rahimzadeh M. Sample size calculation in medical studies. Gastroenterol Hepatol from Bed to Bench. 2013;6(1):14-7.
31. G Ezhumalai. How big a sample do I need require. Ann SBV. 2017;6(1):39-41.
32. Johnson TP, Wislar JS. Response rates and nonresponse errors in surveys [Internet]. JAMA - Journal of the American Medical Association. 2012;307:1805-6. Available from: http://www.aapor.org/Standard_Definitions2.htm.
33. Erik von Elm, Douglas G. Altman, Matthias Egger, Stuart J. Pocock, Peter C. Gøtzsche JPV. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for Reporting Observational Studies. PLoS Med [Internet]. 2007;4(10):1623-7. Available from: http://www.epidem.com/
34. 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]. www.thelancet.com. 2007;370. Available from: www.plosmedicine.org
35. Liao D, Valliant R. Variance inflation factors in the analysis of complex survey data. Surv Methodol. 2012;38(1):53-62.
36. 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(07):754-67.
37. 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.