



## **A Survey of Health Care Professionals' Knowledge and Practice toward Penicillin Allergy**

**Mohamed Balaha <sup>a</sup>, Nehad Ahmed <sup>a\*</sup>, Faisal Alonazi <sup>b</sup> and Saleh Alshehri <sup>b</sup>**

<sup>a</sup> Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia.

<sup>b</sup> College of Pharmacy, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JPRI/2021/v33i51A33460

#### Editor(s):

(1) Dr. Giuseppe Murdaca, University of Genoa, Italy.

#### Reviewers:

(1) Celso Eduardo Olivier, Instituto Alergoimuno de Americana, Brazil.

(2) Vinayak B. Angadi, Shri B M Kankanawadi Ayurveda Mahavidyalaya, India.  
Complete Peer review History: <https://www.sdiarticle4.com/review-history/76045>

**Original Research Article**

**Received 05 September 2021**

**Accepted 10 November 2021**

**Published 20 November 2021**

### **ABSTRACT**

**Aim:** The present study aimed to describe health care professionals' Knowledge and Practice toward Penicillin Allergy.

**Methodology:** This was a cross sectional study that was conducted in Riyadh, Saudi Arabia. The data of the present study were collected from the health care professionals using an online survey that was prepared using google forms and was sent to health care specialists through WhatsApp.

**Results:** About 13% of the respondents don't take the allergy history, 12% rarely take the allergy history, and 21% of the respondents said that they take the history sometimes. Only 45.07% of the healthcare providers said that they are satisfied with their knowledge of drug hypersensitivity reactions. Moreover, more than 70% of the healthcare workers agreed that penicillin allergy has an adverse impact on patient's quality of life. More than 44% of them informed that penicillin allergy occurred frequently in their daily practice.

**Conclusion:** There was a lack in the knowledge of the healthcare providers about penicillin allergy. Educational interventions are needed in order to increase the awareness of the healthcare providers and to improve the wise use of penicillin and other antibiotics.

\*Corresponding author: E-mail: [n.ahmed@psau.edu.sa](mailto:n.ahmed@psau.edu.sa), [pharmdnehadjaser@yahoo.com](mailto:pharmdnehadjaser@yahoo.com);

**Keywords:** Health care professionals; knowledge; penicillin allergy.

## 1. INTRODUCTION

Antibiotics are used to prevent or manage some types of bacterial infections. They work by preventing bacteria from spreading or by killing them [1]. Penicillin antibiotics are used to manage numerous types of infections caused by bacteria [2]. They are used to treat infections of the middle ear, stomach, sinuses, bladder, intestines, and kidney. They also are used to treat pneumonia, sepsis, meningitis, endocarditis, uncomplicated gonorrhea, and other serious infections [2].

Prescribing the most suitable antibiotic class, the narrowest effective spectrum, duration, and dose will help to improve the outcomes of the patient and to reduce the development of antibiotic resistance [3]. Allergies to antibiotics affect prescribing decisions and sometimes preventing treatment with the appropriate (first-line) antibiotics [3].

Penicillin allergy can be defined as an abnormal reaction of the immune system to the penicillin [4]. Common symptoms and signs of penicillin allergy include rash, hives, and itching. Severe reactions include anaphylaxis that is a life-threatening condition affects multiple body systems [4]. Previous studies showed that approximately 10% of the individuals have a record of penicillin allergy but, notably, only 10 to 20% of these patients have a true allergy after formal testing [5-7].

Generally, there is a lack of health care providers' knowledge about penicillin allergy. A previous study showed that health care providers have insufficient knowledge about antibiotic allergies and that it is difficult for health care providers to distinguish an allergy from an adverse effect [8]. The present study aimed to describe pharmacists, nurses, and doctors' Knowledge and Practice toward Penicillin Allergy.

## 2. METHODOLOGY

The present study was a cross sectional study that was conducted in Riyadh, Saudi Arabia in 2021. The data of the present study were collected from the health care professionals who work in Riyadh using an online survey that was prepared using google forms and was sent to health care specialists through WhatsApp.

The collected data were collected and analyzed using excel software to determine the demographic data of health care professionals in addition to their response to the main survey questions. After that the data was shown in table 1 and table 2 as numbers and percentages.

## 3. RESULTS AND DISCUSSION

The survey was filled by 213 health care workers. Most of the respondents were male (68.08%) and more than 83% of them had bachelor degree. The majority of the respondents were pharmacists (72.77%). Demographic data of the respondents were shown in Table 1.

Fig. 1 showed the response of health care providers to the question "how often do you take the patient's allergy history before penicillin administration. Unfortunately, 13% of the respondents don't take the allergy history, 12% occasionally take the allergy history, and 21% of the respondents said that they take the history sometimes.

Table 2 shows health care professionals' knowledge and practice toward penicillin allergy. Only 45.07% of the healthcare providers said that they are satisfied with their knowledge of drug hypersensitivity reactions. More than 70% of the healthcare workers agreed that penicillin allergy has an adverse impact on patient's quality of life. More than 44% of them informed that penicillin allergy occurred frequently in their daily practice. Furthermore, only 37.09% of the health care professionals said that they follow a penicillin usage guideline.

The results showed that there was a lack in the knowledge of the healthcare providers about penicillin allergy. Blumenthal et al stated that about 42% of the clinicians have never received prior drug allergy education, have low awareness of penicillin skin testing, and lack general knowledge of penicillin allergy [9]. Puchner and Zacharisen informed that there is a lack in the knowledge of health care specialists about penicillin allergy and that there is a need for increased penicillin allergy education [10].

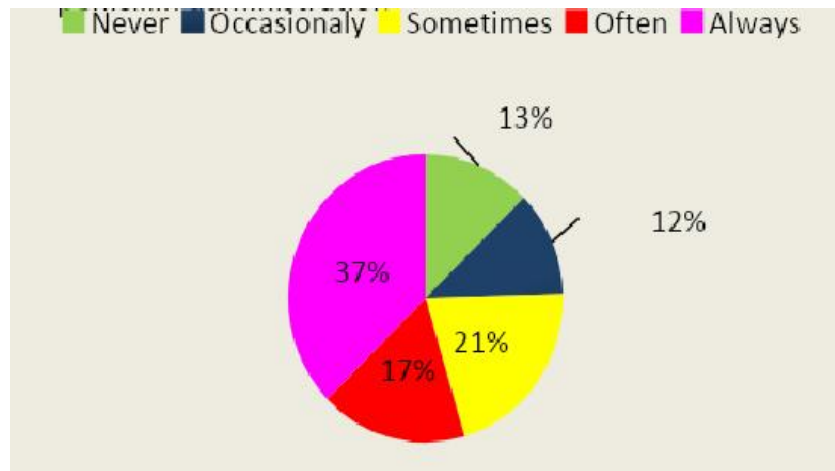
Wang et al state that the healthcare practitioners demonstrated a low level of knowledge about Drug allergy and that advanced education became imperative to eliminate the gaps of knowledge and practices [11]. Trubiano et al

informed that incorporation of allergy teaching into infectious diseases training programs and undergraduate medical teaching and the application of clinical guidelines to manage

remote allergies are likely to have significant impacts on prescribing in those with antibiotic allergy labels [12].

**Table 1. Demographic data of the respondents**

Variable	Category	Number	Percentage
Gender	Male	145	68.08
	Female	68	31.92
Education level	Bachelor	177	83.10
	Master	36	16.90
Specialty	Pharmacy	155	72.77
	Nurse	37	17.37
	Doctor	21	9.86



**Fig. 1. Taking the patient's allergy history before penicillin administration**

**Table 2. Health care professionals' knowledge and practice toward penicillin allergy**

Variable	Category	Number	Percentage
Are you satisfied with your knowledge of drug hypersensitivity reactions	Yes	96	45.07%
	No	117	54.93%
Penicillin allergy has an adverse impact on patient's quality of life	Agree	150	70.42%
	Neutral	29	13.62%
	Disagree	34	15.96%
Is penicillin allergy occurred frequently in your daily practice	Agree	95	44.60%
	Neutral	44	20.66%
	Disagree	74	34.74%
Do you Follow a penicillin usage guideline	Yes	79	37.09%
	No	134	62.91%

Trubiano and Phillips stated that in order to improve the knowledge of healthcare practitioners and to improve their practices, it is important to Integrate antibiotic allergy management into the decision support systems of inpatient and outpatient antimicrobial stewardship programs that represents an important opportunity to further improve measured outcomes from antibiotic utilization [13].

#### 4. CONCLUSION

There was a lack in the knowledge of the healthcare providers about penicillin allergy. Educational interventions are needed in order to increase the awareness of the healthcare providers and to improve the wise use of penicillin and other antibiotics.

#### CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

#### ETHICAL APPROVAL

This study was approved by the university IRB committee with an approval number of REC-HSD-46-2021.

#### ACKNOWLEDGEMENT

This Publication was supported by the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

1. NHS. Antibiotics. Accessed 11 OCT 2021. Available:<https://www.nhs.uk/conditions/antibiotics/>.
2. Medicinenet. What are the uses for penicillin antibiotics. Accessed 11 OCT 2021. Available:[https://www.medicinenet.com/penicillins-injection/article.htm#what\\_are\\_the\\_uses\\_of\\_penicillin\\_antibiotics](https://www.medicinenet.com/penicillins-injection/article.htm#what_are_the_uses_of_penicillin_antibiotics)
3. Wanat M, Anthierens S, Butler CC, Wright JM, Dracup N, Pavitt SH, et al. Patient and Prescriber Views of Penicillin Allergy Testing and Subsequent Antibiotic Use: A Rapid Review. *Antibiotics*. 2018;7(3),71.
4. MayoClinic. Penicillin allergy. Accessed 11 OCT 2021. Available:<https://www.mayoclinic.org/diseases-conditions/penicillin-allergy/symptoms-causes/syc-20376222>
5. Clinical Guideline Centre. Drug allergy: diagnosis and management of drug allergy in adults, children and young people. Accessed 11 OCT 2021. Available:<https://www.nice.org.uk/guidance/cg183/evidence/drug-allergy-fullguideline193159693>
6. Mota I, Gaspar Â, Chambel M, Piedade S, Morais-Almeida M. Hypersensitivity to beta-lactam antibiotics: a threeyear study. *Eur Ann Allergy Clin Immunol*. 2016;48:212-9.
7. Salkind AR, Cuddy PG, Foxworth JW. The rational clinical examination: is this patient allergic to penicillin? An evidence-based analysis of the likelihood of penicillin allergy. *JAMA*. 2001;285:2498-2505.
8. De Clercq K, Cals JW, de Bont EG. Inappropriate antibiotic allergy documentation in health records: a qualitative study on family physicians' and pharmacists' experiences. *Ann. Fam. Med*. 2020;18(4):326-333.
9. Blumenthal K, Shenoy E, Hurwitz S, Varughese C, Hooper D, Banerji A. Survey of inpatient clinical providers' antibiotic prescribing knowledge. *J Allergy Clin Immunol Pract*. 2014;2:407-413
10. Puchner TC Jr, Zacharisen MC. A survey of antibiotic prescribing and knowledge of penicillin allergy. *Ann Allergy Asthma Immunol*. 2002;88(1):24-9.
11. Wang Y, Zhu R, Huang N, Li W, Yang L, Zhang S. Knowledge, attitudes, and practices survey of drug allergy among healthcare practitioners in central China: a multicenter study. *Asia Pac. Allergy*. 2016; 6(2):105-111.
12. Trubiano JA, Beekmann SE, Worth LJ, Polgreen PM, Thursky KA, Slavin MA, et al. Grayson ML, Phillips EJ. Improving antimicrobial stewardship by antibiotic allergy delabeling: evaluation of knowledge, attitude, and practices throughout the emerging infections network. *Open Forum Infect. Dis*. 2016; 3(3):ofw153.

13. Trubiano J, Phillips E. Antimicrobial stewardship's new weapon? A review of antibiotic allergy and pathways to 'de-labeling'. *Curr. Opin. Infect. Dis.* 2013; 26(6):526–537.

---

© 2021 Balaha et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle4.com/review-history/76045>