



# Evaluating Cypriot Pharmacist's Knowledge of Alcohol-Medication Interactions

Glykeria Panayidou<sup>1</sup>, Periklis Charalampous<sup>2</sup>, Michael Petrides<sup>1</sup> and Aliko Peletidi<sup>1,3\*</sup>

<sup>1</sup>Pharmacy Programme, Department of Health Sciences, School of Life and Health Sciences, University of Nicosia, 2417, Nicosia, Cyprus

<sup>2</sup>Department of Public Health, Erasmus MC University Medical Center, Rotterdam, The Netherlands.

<sup>3</sup>School of Pharmacy, Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne, UK

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## CORRESPONDING

### AUTHORS:

Aliko Peletidi;  
e-mail: peletidi.a@unic.ac.cy

## ABSTRACT

**Background:** Many medications can interact when taken with alcohol, thereby altering the metabolism and the medication effects. However, pharmacists' knowledge about the alcohol-medication interactions have not yet been studied in the Republic of Cyprus.

**Objective:** Our objective was to examine the pharmacists' knowledge on possible alcohol-medication interactions and to uncover whether they are able to identify and/or counsel patients who may have high-risk alcohol behaviors.

**Methods:** A self-administered questionnaire was developed, consisting of 37 questions, and distributed to Cypriot community pharmacists of the capital of Cyprus namely, Nicosia. All questions were based on 5-point Likert scale items and collected through electronic response receipts. Three topics were evaluated and critically discussed: (i) Knowledge of community pharmacists about alcohol abuse and ability to counsel; (ii) Knowledge of community pharmacists about alcohol-medication interactions; and (iii) Past experiences of community pharmacists with heavy-alcohol drinkers.

**Results:** A total of 68 Cypriot pharmacists (males: 48.5% vs. females: 51.5%) participated in this study. Most pharmacists (n=44, 64.7%) agreed that they were confident in advising their patients about the harmful use of alcohol consumption. Some pharmacists (n=26, 38.2%) agreed to discuss the current alcohol guidelines with their patients and having the ability to advise them. Around 57% of the pharmacists (n=39/68) suggested to counsel Cypriot patients about the effects of alcohol-medication interactions. The vast majority of Cypriot pharmacists (85.3%) indicated that warfarin when taken with alcohol can cause "Internal haemorrhage".

**Conclusion:** This study reports the first results on Cypriot pharmacist's knowledge and views about alcohol-medication interactions. Although most Cypriot pharmacists are aware of most of the interactions, education should be a priority for community pharmacists in Cyprus in order to utilize primary health services.

## Introduction

Older adults often use multiple medications simultaneously, including medications having the potential to interact with alcohol<sup>1-3</sup>. The concurrent use of medication and alcohol is common as more than one in three older adults who take prescriptions are exposed to at least one alcohol interactive medication<sup>4-5</sup>. Community pharmacists are, however, the first point of contact and are considered one of the most trustworthy health-care professionals.

Pharmacists have regular contact with patients having chronic and/or co-morbid conditions, and thus their services on alcohol-medication interactions might be crucial. Therefore, community pharmacists can play an important role in the brief intervention process through provision of alcohol use and/or alcohol-medication services<sup>6-8</sup>. This indicates that community pharmacists can identify individuals who may have risky drinking behaviours as well as they have the knowledge to advice and educate these individuals regarding the harmful alcohol use and/or alcohol-medication interactions. Alarming-ly, studies exploring the knowledge of community pharmacists in alcohol-medication use as well as their potential to offer brief interventions are limited or not yet available for some countries.

In Cyprus - a Europe's high-income country - over the period from 1990 to 2017, the burden of non-communicable diseases remained stable for ischemic heart disease, neoplasms, and diabetes among males and females<sup>9</sup>. The Cypriot population has several characteristics linked with the co-occurrence of several other chronic conditions. For instance, Cyprus has a high prevalence of smoking, overweight and obese people, hypertension, and alcohol abuse among males and females, respec-

tively<sup>10-14</sup>. Another example is that on diabetes and mental health, Cyprus has a higher disease burden compared to the most European region countries<sup>15</sup>. Driven by the fact that, older adults with co-morbid health conditions have more health needs and require medication attention and that the role of Cypriot pharmacists has been moved towards a more patient-centred approach, it is of great importance to examine pharmacists' knowledge and views on alcohol-medication interactions<sup>16</sup>. Furthermore, we aimed to investigate the current knowledge of Cypriot pharmacists about the alcohol use and alcohol-medication interactions as well as to uncover whether they are able to identify and counsel patients who may have risky drinking behaviours.

## Methodology

### *Data collection instrument*

A self-administered questionnaire was developed after an extensive literature review on alcohol-medication interactions and pharmacists' views<sup>17-22</sup>. The final form of the questionnaire consisted of four sections. The first section (16 questions) examined the knowledge as well as involvement of community pharmacists in advising patients with high-risk alcohol behaviors. The second section (15 questions) examined pharmacists' current knowledge on alcohol-medication interactions using multiple-choice questions. The third section consisted of two questions: the first examined the pharmacists' ability to support and counsel patients with a previous history on alcohol abuse and the second one examined how often pharmacists encounter those patients. Responses from the first and third section of the questionnaire were received based on the 5-point Likert

scale. The last section of the questionnaire collected demographic information (gender and age) and other data (years of experience, location).

### ***Location and sample***

The list of community pharmacies was found via the official website of the Pharmaceutical Services of the Cypriot Ministry of Health<sup>23</sup>. Thus, the community pharmacies were selected by convenience sampling to include small independent pharmacies across the largest areas belonging in the capital of Cyprus, Nicosia (i.e., Center of Nicosia, Engomi, Ayios Dometios, Lakatamia, Strovolos, Latsia, and Aglantzia). In total, 158 pharmacies were selected from the list and 68 pharmacies were considered as the final sample of this study.

### ***Pilot study***

After ethics approval by the Pancyprian Pharmaceutical Association, we assessed for content and face validity by sending and/or discussing it with one community pharmacist (AK) and one lecturer (MP) in pharmacy practice from the University of Nicosia, Cyprus. The outcomes of the pilot indicated that the questionnaire was suitable for pharmacy professional, and required some minor amendments of questions. The community pharmacist involved in the pilot was excluded to avoid any type of bias.

### ***Data collection and Analysis***

Pharmacists who responded positively to an online invitation were eligible to participate in this study. Their responses were collected via electronic response receipts. The participation was anonymous and on a voluntary basis. All respondents agreed to participate by submitting a fully complete questionnaire. Additionally, the data analysis was performed using Microsoft Excel. At a first step, demographic data were analyzed using descriptive statistics. At a second step, the 5-point Likert scale items used in each section of the questionnaire were grouped together into a single composite score.

## **Results**

### ***Demographic characteristics***

The demographics of the study population are summarized in Table 1. In total, 68 community pharmacists were participated. Out of these 68 community pharmacists, 35 (51.5%) were females, and the remaining 33 (48.5%) were males. The highest percentage of responses received by pharmacists aged 41-47 (n=15, 22.1%), while the lowest one received by older pharmacists aged 61-65 (n=4, 5.9%), following those aged 66 and above (n=2, 2.9%). The responses received from the selected locations considerably varied, from the highest percentage in the Center of Nicosia (n=26, 38.2%) to the lowest percentage in Ayios Dometios (n=2, 2.9%). Most of the participants (n=14, 20.5%) had 26-30 years of experience (Table 1).

### ***Knowledge of community pharmacists about alcohol abuse and ability to counsel***

Figure 1 shows pharmacists' knowledge about alcohol abuse and their ability to support and counsel. Most community pharmacists, 57.4% (n=39) agreed and 39.7% (n=27) strongly agreed, that they were well informed about alcohol abuse and its damaging consequences. Also, the majority of the community pharmacists (n=44, 64.7%) agreed that they were confident in advising their patients about the harmful use of alcohol consumption. Many of the Cypriot community pharmacists (n=41, 60.3%) showed no opinion to open a dialog with patients having high-risk alcohol behaviors. On the other hand, 41.2% (n=28) agreed that supporting and counseling patients having high-risk alcohol behaviors as well as patients having other health-related issues is part of their daily role as pharmacists. About half of the participants (n=39, 57.4%) agreed on having the courage to refer heavy alcohol drinkers to their general practitioners, whereas some of the participants (n=32, 47.1%) felt comfortable recommending and/or referring their patients to detoxification centers, if needed. Around one in three pharmacists (n=19, 27.9%) disagreed that when meeting heavy alcohol

**Table 1: Demographic characteristics of community pharmacists**

Characteristics	Categories	Frequency (n)	Percentage (%)
Gender	Males	33	48.5
	Females	35	51.5
Age	23-29	8	11.8
	30-35	8	11.8
	36-40	9	13.2
	41-47	15	22.1
	48-54	13	19.1
	55-60	9	13.2
	61-65	4	5.9
≥ 66	2	2.9	
Location	Center of Nicosia	26	38.2
	Engomi	6	8.8
	Ayios Dometios	2	2.9
	Lakatamia	7	10.3
	Strovolos	17	25
	Latsia	4	5.9
	Aglantzia	6	8.8
Years of experience	0-5	11	16.2
	6-10	11	16.2
	11-15	7	10.3
	16-20	8	11.8
	21-25	8	11.8
	26-30	14	20.5
	≥ 31	9	13.2

drinkers in their community pharmacies made them feel uncomfortable. However, some of the pharmacists (n=26, 38.2%) agreed to discuss the current alcohol guidelines with their patients and having the ability to advise, especially those having high-risk

alcohol behaviors.

#### ***Knowledge of community pharmacists about alcohol-medication interactions***

Table 2 shows in detail pharmacists' current

Figure 1: Knowledge of community pharmacists about alcohol abuse and ability to counsel

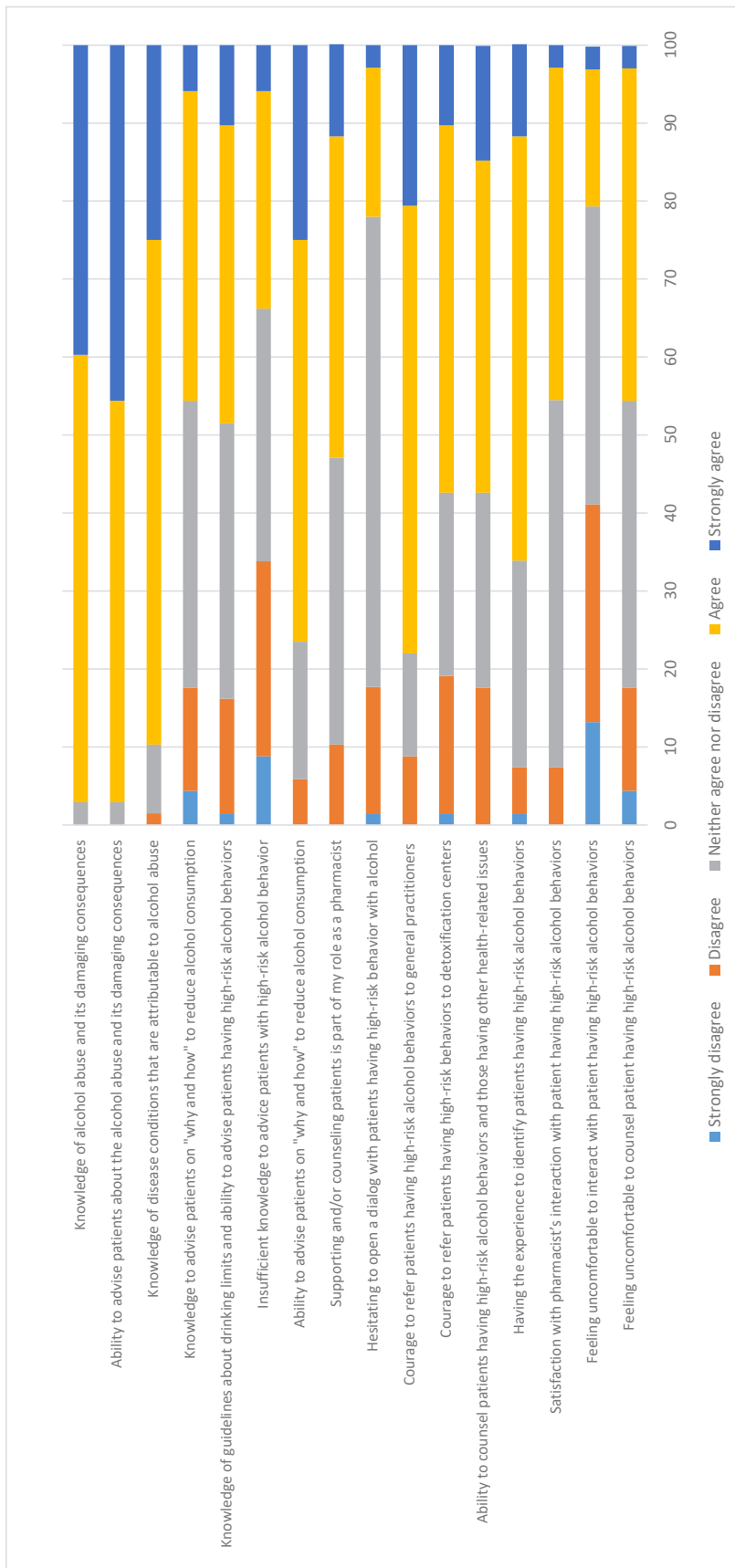


Table 2: Categories of medications examined as regards their harmful interactions resulting from their simultaneous consumption with alcohol

Active substances	Treatment	Responses received from the Cypriot pharmacists
Isosorbide mononitrate & Isosorbide dinitrate	Angina	Correct answer (Dizziness): n=38, 55.9% Other: n=30, 44.1%
Lorazepam & Paroxetine	Stress	Correct answer (Drowsiness): n=56, 82.4% Other: n=12, 17.6%
Warfarin	Blood clots	Correct answer (Internal hemorrhage): n=58, 85.3% Other: n=10, 14.7%
Venlafaxine, Amitriptyline & Escitalopram	Depression	Correct answer (Distress): n=34, 50% Other: n=34, 50%
Metformin	Diabetes	Correct answer (Weakness): n=31, 45.6% Other (e.g., liver damage): n=33, 48.5% Other: n=4, 5.9%
Losartan & Enalapril	Hypertension	Correct answer (Fainting): n=35, 51.5% Other: n=33, 48.5%
Rosuvastatin	Hypercholesterolemia	Correct answer (Liver damage): n=60, 88.2% Other: n=8, 11.8%
Metronidazole	Infections	Correct answer (Tachycardia): n=26, 38% Other (e.g., nausea): n=37, 54.4% Other: n=5, 7.6%
Ibuprofen	Symptomatic relief from mild to moderate pain (e.g., headache, toothache, dysmenorrhea), fever and inflammation	Correct answer (Ulcers): n=59, 86.8% Other: n=9, 13.2%
Paracetamol or Acetaminophen	Symptomatic relief from mild to moderate pain (e.g., joint pain, muscle aches, neuralgia, headache, toothache, period pain) and fever	Correct answer (Headache): n=25, 36.8% Other: n=43, 63.2%

Table 2, continued

Aspirin in low doses	Prevention of cardiovascular diseases	Correct answer (Hemorrhage): n=58, 85.3% Other: n=10, 14.7%
Phenytoin	Epilepsy	Correct answer (Drowsiness): n=21, 30.9% Other: n=47, 69.1%
Zolpidem	Short-term treatment for insomnia	Correct answer (Memory problems): n=46, 67.6% Other: n=22, 32.4%

knowledge on alcohol-medication interactions for a total of 18 active substances. Around half community pharmacists (n=38, 55.9%) indicated that isosorbide mononitrate/dinitrate (i.e., angina medications) cause “Dizziness” when taken with alcohol. Almost all participants (n=56, 82.4%) were aware that lorazepam and paroxetine (i.e., anxiolytic medications) when taken with alcohol interact and cause “Drowsiness”. Almost all pharmacists (n=58, 85.3%) indicated that warfarin (i.e., anticoagulant medication) when taken with alcohol can cause “Internal haemorrhage”. Also, half of the participants 50% (n=34) stated that venlafaxine, amitriptyline, and escitalopram (i.e., antidepressant medications) can affect the human body causing “Distress” when taken with alcohol.

Although when metformin (i.e., anti-diabetic medication) is taken with alcohol causes “Weakness”, most participants (n=33, 48.5%) stated that this interaction can cause “Liver damage”, while 45.6% (n=31) placed the correct answer. Also, 51.5% (n=35) of the participants were aware that losartan and enalapril (i.e., antihypertensive medications), interact with alcohol causing “Fainting”. The higher percentage of participants (n=60, 88.2%) were aware that rosuvastatin (i.e., medication for hypercholesterolemia) when is taken with alcohol causes “Liver damage”. Similarly happened with aspirin in low doses (i.e., cardioprotective medication), where 85.3% (n=58) of the participants chose “Haemorrhage” as the correct answer.

Moreover, there was one question regarding

which vitamin’s properties are decreased by alcohol consumption, and even though the correct answer was “Folic acid”, the highest percentage of community pharmacists (n=47, 69.1%) stated “B12” as the correct answer. With regard to the effects of simultaneous consumption of alcohol-caffeine (please note that, the source of caffeine can be chemical or not), most pharmacists (n=39, 57.4%) stated that this may cause “Insomnia” which was the right choice.

#### ***Past experiences of community pharmacists with heavy-alcohol drinkers***

The first question examined pharmacists’ ability to support and counsel patients with a history on alcohol abuse. Most of them (n=39, 57.4%) were not be able to express their opinion, thereby responded “Neither bad nor good”. Also, 32.4% (n=22) of the pharmacists ranked their knowledge on general alcohol-related questions as “Good”, whereas few of them (n=4, 5.9%) ranked their knowledge as “Bad”. Also, very few pharmacists (n=2, 2.9%) and (n=1, 1.5%) ranked their knowledge as “Very good” and “Very bad”, respectively.

The second question examined how often pharmacists encounter heavy alcohol drinkers in their community pharmacies. In regard to the question on how often the community pharmacists are faced with such cases, almost all participants (n=49, 72.1%) responded “Rarely”; 22.1% (n=15) stated “Sometimes”; and two pharmacists stated “Very often” (n=1, 1.5%) and “Never” (n=1, 1.5%).

## Discussion

This study has provided insights into the knowledge of Cypriot pharmacists concerning alcohol-medication interactions as well as Cypriot pharmacist's ability to counsel patients with high-risk alcohol behaviors. Although most pharmacists are well aware of these interactions, they avoided pointing them out to their patients expressing that may feel uncomfortable and/or cause worries than awareness to their patients. Alarmingly, the vast majority of Cypriot pharmacists stated that informing their patients about the harmful interactions of alcohol-medication use and/or their health effects is part of their daily role.

However, the fact that pharmacists do not often encounter patients with high-risk alcohol behaviors in Cyprus, may render the development of an initial screening and brief intervention on alcohol consumption less realist. It should be noted that previous health initiatives aiming to expand the role of Cypriot pharmacists have been previously made<sup>24</sup>. Developing motivational interviewing skills, combined with brief interventions and alcohol control, will become the cornerstone of an alcohol brief intervention training program which ought to be implemented by community pharmacies<sup>25-26</sup>. Our findings are comparable with other similar studies. For instance, a study performed by McCaig et al.<sup>17</sup> examining the knowledge, views and confidence level of pharmacists in order to characterize their current level of activity and views on providing alcohol-use related advice in Scotland. Their findings illustrated that pharmacists in Scotland provide little advice on alcohol use, have a reasonable knowledge of recommended limits but lack the knowledge and confidence to provide a health brief primary intervention. Furthermore, a survey conducted by Barnes and Chappell<sup>18</sup> in six urban centres across Canada namely, Vancouver, Edmonton Saskatoon, Winnipeg, Toronto, and Montreal aimed to examine pharmacists' knowledge of alcohol-medication interactions. Their findings highlighted that community pharmacists

were less knowledgeable compared to hospital pharmacists as they had greater oversight of patient medication administration. This indicates that education concerning alcohol-medication use for community pharmacists is critical and may be useful for future public health calls even though a brief intervention delivered by community pharmacists appears to have had no effect in reducing hazardous or harmful alcohol consumption<sup>8</sup>.

Our research has certain limitations. First despite the fact that in the questionnaire was clearly stated that there was only one correct answer (i.e., alcohol-medication interactions), Cypriot pharmacists chose more than one answer because they faced a dilemma when deciding what would be the correct one. Second, the response rate (43%) and thus, the small sample size can affect our findings which in turn may not be representable for the whole Cypriot pharmacy community. Despite these limitations, this study reports the first findings of pharmacy knowledge and views on alcohol-medication interactions.

## Conclusion

In conclusion, the need for a structured and continuous training system for community pharmacists through the provision of information by the Pancyprian Pharmaceutical Association, in collaboration with the Ministry of Health in Cyprus, will lead to better practices for community pharmacists by properly addressing the management of patients-customers that consume medications and alcohol at the same time. Their advisory role and the service that must be provided by community pharmacists is necessary and essential to ensure healthier outcomes and more informed citizens. In devastation, the promotion and the proper influence of brief innervation will become the key to saving the lives of patients with chronic or even irreversible pathological conditions, and will reduce alcohol and medication related morbidity and mortality rates in the population. □



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