



## **North Cyprus Pharmacist's Cognition and Practice of Pharmaceutical Care**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author ATZ was responsible for design and implementation of the study. Authors AMA and BB finalized the study design and coordinated implementation. Author ATZ collected data, author LS carried statistical analysis, authors ATZ and AMA carried data interpretation and creation of the manuscript. Authors AMA and BB supervised, reviewed and improved manuscript. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JPRI/2018/39051

Editor(s):

(1) Rafik Karaman, Professor, Bioorganic Chemistry, College of Pharmacy, Al-Quds University, USA.

Reviewers:

(1) Valenitna Petkova, Medical University, Bulgaria.

(2) Kumud Kumar Kafle, Tribhuvan University, Nepal.

(3) Denise Bueno, Universidade Federal do Rio Grande do Sul, Brazil.

Complete Peer review History: <http://www.sciencedomain.org/review-history/23431>

**Short Research Article**

**Received 18<sup>th</sup> December 2017**  
**Accepted 26<sup>th</sup> February 2018**  
**Published 4<sup>th</sup> March 2018**

### **ABSTRACT**

The aim of this project is to assess community pharmacists' attitudes towards their professional practice and to determine their perceived competence in various pharmaceutical activities.

The philosophy of Pharmaceutical care focuses on the responsibility of pharmacist to meet all of the patient's drug-related needs, and assist the patients in achieving their goal through collaboration with other health professionals.

**Materials and Methods:** The study was conducted prospectively between January and March 2016. It involved community pharmacists working in pharmacies within North Cyprus. There are 190 pharmacies in North Cyprus, 110 questionnaires were administered out of which 80 completed giving a response rate of 78.0% from pharmacists working in community pharmacies.

**Results:** The result of the current study showed that 97.5% of respondents had knowledge deficit of pharmaceutical care concepts but there is a positive attitude towards the practice of

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pharmaceutical care.

In comparing pharmacist's perceptions toward pharmaceutical care, no significant difference was noticed between females and males. While young and new pharmacists significantly ( $p=0.0001$ ) believe more than older more experienced pharmacists that a pharmacist is only responsible to dispense or counsel the patients on the drug prescribed by him or the physicians.

**Conclusion:** Pharmacists in North Cyprus had positive pharmaceutical care orientations. This should encourage pharmacist bodies' educators and regulatory agencies to design initiatives to increase the frequency and quality of practicing pharmaceutical care in community pharmacy.

*Keywords: Attitude; knowledge; practice; community pharmacists; pharmaceutical care.*

## 1. INTRODUCTION

The philosophy of pharmaceutical care focuses on the responsibility of pharmacist to meet all of the patient's drug-related needs, and assist the patients in achieving their goal through collaboration with other health professionals. An adequate pharmaceutical service provided by a pharmacist is a vital component of the health care delivery system.

Pharmaceutical care (PC) as defined by Heplar and Strand [1] is the responsible provision of drug therapy for achieving definite outcomes that improve the patient's quality of life. While the international Pharmaceutical Federation (FIP) defined pharmaceutical care as the responsible provision of pharmacotherapy for the purpose of achieving definite outcomes that improve or maintain a patient's quality of life [2]. Pharmaceutical care is recognized as a prominent activity within a health care system, it is a structured, systematic and documented type of pharmacy practice which comprises of the detection, prevention and solution to drug-related problems. The goal of pharmaceutical care is to optimize the patients' health-related quality of life and achieve positive clinical outcomes, within realistic economic expenditure [3,4].

The shift of pharmacy practice from product oriented to patient-oriented results in greater interaction between pharmacists and other medical professionals and thus has culminated in safer, more effective and less costly therapy in the new era of patient care. PC is a new concept in North Cyprus. Thus, a stepwise process is expected to be followed in implementing the concept and education of clinical pharmacy. Recently the duration of undergraduate pharmacy education has increased to five years in Turkey and North Cyprus, consisting of more clinical contents making a good opportunity for further implementation of the concept [5]. The discipline of PC arose with the dissatisfaction of older practice norms and pressing need for a

competent health professional with a comprehensive knowledge in the therapeutic use of drugs [6].

The PC framework assumes a patient-pharmacist professional relationship that is based up on caring, trust, communication, corporation and mutual decision making in which the pharmacists work very closely with the patient to promote health, to prevent disease and to insure that drug therapy is safe and effective [7]. So level of interaction between pharmacists and other medical professionals is a key to the establishment and development of PC.

Pharmaceutical care can be provided in different settings in primary secondary and tertiary care settings as advanced care practices are reported from different countries across Europe [8,9] but not in North Cyprus. Different barriers were reported to attenuate the implementation of pharmaceutical care practice including time, attitudes and opinions, clinical education, communication skills and other pharmacists' individual or personal attributes [10-13]. Contrary to this a recent review of 47 published articles reported that pharmacist' attitudes toward role extensions and new pharmacy service models are generally positive [14].

In North Cyprus few recent studies reported the first introduction of clinical pharmacy services in hospitals and community settings, [15-17] else as there are no outpatient pharmacies within hospitals; a community pharmacy is the main setting for pharmacists in North Cyprus to deliver their indispensable services and practice cognitive pharmaceutical care services [18]. From here rises the importance of assessing community pharmacist's perceptions and practice of pharmaceutical care in North Cyprus.

## 2. MATERIALS AND METHODS

The study was conducted prospectively between January and March 2016. It involved community

pharmacists working in pharmacies in North Cyprus. There was 190 licensed pharmacies majority operating in the 5 main cities in North Cyprus, 110 was determined as the minimum required sample size on 90% confidence level, 5% margin of error and 50% response distribution. 110 questionnaires were administered arbitrary and collected in face-to-face mode. Self-administered, pretested, and structured questionnaire was used, obtained from the literature [19].

## 2.1 Statistical Analysis

The distinct investigation was utilized to analyze the study's consequences. An information collection form was utilized to facilitate the information extraction process. All gathered information was examined statistically by utilizing Statistical Package for the Social Science (SPSS) programming version 22.0 and Graph pad prism version 6.07. The values are given as a percentage of the total responder's number. Chi-square test or Fisher's exact test was used as appropriate for categorizing the data. Pearson Chi-Square or Fisher's Exact Test  $P < 0.05$  was accepted as statistically significant. Continuous data were expressed as mean ( $\pm$  standard deviation) or median (range), while absolute information was communicated as frequency and percentage (%). Kruskal – Wallis test and Mann-Whitney tests were used to compare mean responses within sub-demographic groups.

## 3. RESULTS

110 questionnaires were administered out of which 80 were completed giving a response rate

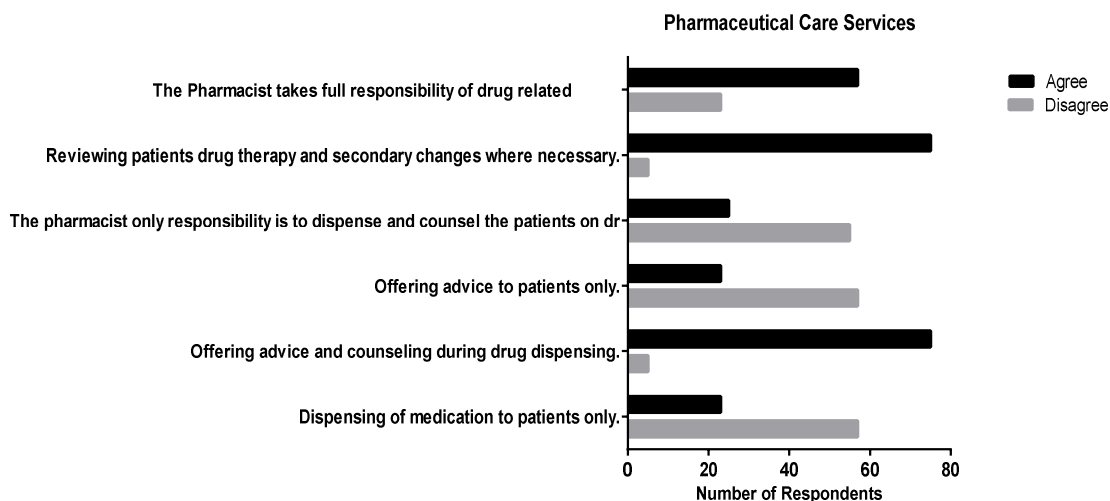
of 60.0%. 73% of respondents were females while males account for 27.5%. Age distribution of respondents showed that 46.25% of the workforces are above age 30. Those within 1-5 years of working experience forms 47.5% of respondents (Table 1).

Ninety-two percent of the respondents offered advice and counselling during dispensing. Only 28% defined pharmaceutical care as dispensing of medication to the patient only. Ninety two percent feel a review of patient's drug therapy and secondary changes to prescriptions to be necessary, while 71.25% agree that pharmacists should take full responsibility for drug-related needs of patients. However, 31.25% defined pharmaceutical care as the responsibility of pharmacists to dispense and counsel the drugs prescribed by him or the physician. (Table 2)

On attitude to the practice of pharmaceutical care, 62% of respondents feel pharmaceutical care is a mandate of pharmacists only, 85% see it as a primary responsibility of pharmacists only. High extents 98.75% are of trust that pharmaceutical care is a significant method of practice and will serve to enhance patients health needs. Also 98.75% agree that practising pharmaceutical care in pharmacies will expand patients' confidence in the profession and enhance pharmacy practice. While 78% are of the opinion that practicing pharmaceutical care is resource intensive that is time-consuming, requires more man power and is not worth the trouble. 94.50% believes in order to assure themselves a place in health care team, community pharmacist must practice pharmaceutical care.(Table 3)

**Table 1. Demographic data of respondents**

Characteristics	No. of respondents (n=80)	Percentage of respondents %	Attitude score (mean $\pm$ SD)	Practice score (mean $\pm$ SD)
<b>Sex:</b>				
Male	22	27.5	6.02 $\pm$ 0.82	3.36 $\pm$ 0.87
Female	58	72.5	6.27 $\pm$ 0.70	3.50 $\pm$ 0.59
<b>Age:</b>				
21 -25	26	32.5	6.15 $\pm$ 0.78	3.57 $\pm$ 0.75
26-30	17	21.25	5.88 $\pm$ 0.67	3.77 $\pm$ 0.42
31 and above	37	46.25	6.25 $\pm$ 0.84	3.08 $\pm$ 0.96
<b>Years of experience:</b>				
1 to 5	38	47.5	6.02 $\pm$ 0.75	3.65 $\pm$ 0.53
6 to 10	8	10	6.25 $\pm$ 0.70	3.62 $\pm$ 0.51
11 to15	7	8.75	6.57 $\pm$ 0.53	3.14 $\pm$ 0.89
16 to 20	3	3.75	6.33 $\pm$ 0.57	3.00 $\pm$ 1.00
21 and above	24	30	6.12 $\pm$ 0.94	3.04 $\pm$ 1.04



**Fig. 1. Distribution of knowledge on pharmaceutical care services related with a number of respondents**

**Table 2. Distribution of knowledge on pharmaceutical care services**

Pharmaceutical care services	Agree (%)	Disagree (%)	P-values
Dispensing of medication to patients only.	28.75%	71.25%	P<0.0001
Offering advice and counselling during drug dispensing.	92.50%****	7.50%	P<0.0001
Offering advice to patients only.	28.75%	71.25%	P<0.0001
The pharmacist only responsibility is to dispense and counsel the patients on the drug prescribed by him or the physicians.	31.25%	68.75%	P<0.0001
Reviewing patients drug therapy and secondary changes where necessary.	92.5%****	8%	P<0.0001
The Pharmacist takes full responsibility for drug-related problems	71.25%	28.75%	P<0.0001

\*\*\*\* Significantly higher agreement with this statement compared to other statements

**Table 3. Community pharmacist's attitude towards the practice of pharmaceutical care**

Attitude	Yes (%)	No (%)	P-value
Pharmaceutical care is a mandate of pharmacist only	62.50%	37.50%	P=0.0011
The primary responsibility of pharmacists in general and community pharmacists is to provide pharmaceutical care.	85%	15%	P<0.0001
Pharmaceutical care is a valuable mode of practice and will serve to improve patient health needs.	98.75%****	1.25%	P<0.0001
Practicing pharmaceutical care in community pharmacies will increase patients confidence in the profession and enhance pharmacy practice	98.75%****	1.25%	P<0.0001
Continuous pharmaceutical education is necessary for community pharmacists to practice pharmaceutical care.	96.25%	3.75%	P<0.0001
In order to assure themselves a place in health care team, community pharmacists must practice pharmaceutical care.	94.50%	5.50%	P<0.0001
Practicing pharmaceutical care is too resource intensive, time-consuming and requires more man power.	78.75%	21.25%	P<0.0001

\*\*\*\* Significantly higher agreement with this statement compared to other statements

Regarding the practice of respondents, 91% of community pharmacists collect information from patients before dispensing the prescribed drug. 97% normally identifies prescription problems. 68% had a case of adverse drug reactions (ADR'S) report by patients while 82.5% agree that changing of prescribed medication is part of pharmaceutical care. (Table 4)

On barriers to implementation of pharmaceutical care, 71% agrees that poor relationship of community pharmacists with other health care members is one of the barriers while 54% agree to the fact that lack of confidence in pharmacist themselves is the reason. 80% agrees that lack of trained personnel and support staff needed to offer pharmaceutical care is a barrier. (Table 5)

In comparing pharmacists perceptions toward pharmaceutical care, no significant difference was noticed between females and males. While young and new pharmacists significantly ( $p=0,0001$ ) believe more than older more experienced pharmacists that a pharmacist is only responsible to dispense or counsel the patients on the drug prescribed by him or the physicians. They significantly less ( $p=0,02$ ) agreed with changing prescriptions when needed as being part of the pharmaceutical care provided by a pharmacist, on the other side

young pharmacists saw collecting patient information and history as a major component of pharmaceutical care while old pharmacists did not agree with it ( $p=0,031$ ).

#### 4. DISCUSSION

The philosophy of pharmaceutical care and its practice has been proposed to address the challenges of medication therapy in terms of rational drug use, DRPs prevention and resolution ensuring adherence with sufficient patient education and counseling on medication use and related lifestyle factors [20]. This practice has shown continuously positive impact on patient's wellness and health outcomes [21].

In this survey, we explored pharmacists' attitude and their self-reported behaviour towards pharmaceutical care services in private community pharmacies in North Cyprus. This study described the attitude of Turkish pharmacies towards pharmaceutical care. It also assessed some factors that could lead to the observed attitude score. The instrument used for the assessment was a standardized questionnaire, [19] that has been used in many regions of the world, [22-26] and is used here in North Cyprus for a similar assessment.

**Table 4. Community pharmacist's pharmaceutical care practices**

Practice	Yes (%)	No (%)	P-values
Collection of data from your patients.	91.25%	8.75%	$P<0.0001$
Identify prescription problems.	97.50%****	2.50%	$P<0.0001$
Have you had any reported cases of ADR's by your patients?	68%	32%	$P<0.0001$
As a pharmacist, do you think changing of prescribed Medication is part of pharmaceutical care?	82.50%	17.50%	$P<0.0001$

\*\*\*\* Significantly higher agreement with this statement compared to other statements

**Table 5. Barriers to the implementation of pharmaceutical care**

Barriers	Agree (%)	Disagree (%)	No response (%)	P-values
Poor relationship of community- Pharmacists with other health providers.	71.25%	25%	3.75%	$P<0.0001$
The current curriculum for pharmacy education Is not adequate to support the practice.	54%	43.75%	2.5%	NS
Lack of confidence in pharmacists themselves.	30%	61.25%	8.75%	$P<0.0001$
Lack of trained personnel and support staff to offer Pharmaceutical care.	80%****	17.50%	2.50%	$P<0.0001$

NS: no significant difference

\*\*\*\* Significantly higher agreement with this statement compared to other statements

The results obtained from this study are interesting and provide an insight into pharmacists' perceptions of their professional practice. There are a number of trends which are evident, some of which are not surprising, while others are rather worthy of note. The survey response rate was good (78%) and revealed that majority of pharmacists employed in community pharmacies were females, middle-aged Cypriot Turks having bachelor degrees in pharmacy. This response rate is comparable to studies in Europe assessing pharmacists' attitude to pharmaceutical care in Serbia and Moldova (70% and 78% respectively) [27] and also response reported from Saudi Arabia (71.7%) [23], while the response rate in our study is much higher than those reported from Denmark, Malta and North Ireland [27-30]. Though study methodologies may affect response rates, the majority of the above-mentioned studies used online surveys while in our study face-to-face method was used. Yet differences may attribute to other factors such as involvement of national organizations and bodies and their ability to motivate response.

Majority of pharmacists in community pharmacies were females (>70%) in our study as common across Europe (>50%) except Italy and North Ireland, while mainly males were reported in Arabia to be employed in community pharmacies [23].

In contrast to our findings in which pharmacists reported positive attitudes to pharmaceutical care; Nwaozuzu EE, et al reported findings that showed Nigerian hospital pharmacists to have a mean negative attitude towards pharmaceutical care [24]. Yet both studies reported that within sub-demographic groups data suggest that participants who have more practical experience have less positive attitudes toward PC. Participants who are early in their professional years have higher positive attitudes toward PC though the differences were not found significant statistically in our study ( $p = 0.142$ ). This could be due to the pharmacy practice courses before educational reforms of 2005 were not yet offering advance PC services and education [31-33]. As a result, older pharmacists did not observe the incorporation of PC into routine pharmacy practice.

Nevertheless, attention needs to be paid to older pharmacists to foster a positive attitude in them as these represent the leaders of the profession who should show the younger pharmacists the

way forward in the practice of pharmacy. The less positive attitudes identified in this study could have been caused by the lack of adequate infrastructure and logistics for the implementation and sustenance of pharmaceutical care which majority of surveyed pharmacist reported to be a major barrier for pharmaceutical care implementation followed by lack of collaboration as a barrier. As such efforts need to be made towards the provision of the necessary infrastructure and logistics that will encourage the integration of the philosophy and principles of pharmaceutical care in the practice of pharmacy in North Cyprus.

In answering questions relating to pharmaceutical care, i.e. to what degree respondents perceived the activities listed to be the responsibility of the pharmacist, it appears that respondents are not fully convinced that pharmaceutical care activities are the responsibility of the pharmacist and are still somewhat distant from the concept of the pharmacist as a provider of patient care.

Some of the community pharmacists surveyed (32%) were not aware of the ADR reporting program in North Cyprus. This finding is nearly similar to the results reported for Hong Kong pharmacists and far higher than figures reported by Grootheest AC et al [34] and Green CF et al for Holland (1%) [35] and UK (7%) community pharmacists who were not aware of the ADR reporting program in their countries at that time [36]. These findings may indicate poor program announcement to community pharmacists which are augmented by the fact that most community pharmacists were educated and had their practice in countries that have weak or no ADR reporting programs. The findings emphasize the urgent need to educate and inform the community pharmacists about the ADR reporting program. This effort should be continuous since most of the community pharmacists were practitioners who work for few years and therefore will continue to practice for tenths of years.

Obtaining 80 responses out of 110 distributed questionnaires could be considered as good response rate for this study, this number forming more than 73% of total licensed pharmacists in North Cyprus can be also considered as a reflective sample size.

The second strength of this study is that the surveyed pharmacists included those of all major

cities in North Cyprus: Lefkosa, Magusa, Guzelyurt and Girne.

The questionnaire was translated into the Turkish language by a linguistic expert, the questionnaire was also dispensed face to face which allowed data collectors to further explain or clarify ambiguous questions and items.

Pharmacists who participate in the survey generally were positive toward delivering pharmaceutical care to patients. But also pharmacists who were not willing to participate may have had different views, especially those of older ages since the majority of responders were young or middle-aged.

Pharmacists receiving their degree in the decades prior may have different perspectives and lived experiences concerning the applicability of pharmaceutical care services in North Cyprus.

Of the limitations of our study was no wide range of variations on pharmacist respond maybe due to close ageing and experiences also a question should be asked whether the positive attitudes and practice claims match with the reality of pharmacy practice in North Cyprus, which could be further studied with better objective tools.

From the findings of this study we recommend, though the pharmacists in North Cyprus showed positive attitudes and perception yet it's crucial to develop and maintain continues educational programs that aim to develop a standard understanding and perception of pharmaceutical care and guide pharmacist in developing and maintaining necessary competences for delivering pharmaceutical care. It's important to develop regulatory systems to assure standardization of pharmaceutical care services delivered at community pharmacies and also to assure the preparedness and competence of new graduates to provide a patient care centered service that goes with the global advances in pharmacy practice pharmaceutical care delivery.

Surveys and observations should be used also to gather data on pharmacist beliefs about patient non-adherence, therapy failure and adherence perspectives and interventions. This could be useful for designing educational interventions or practice-based interventions that affect medication use in a constructive, evidence-based manner consistent with patient-centered care.

## 5. CONCLUSION

Pharmacists in North Cyprus had positive pharmaceutical care orientations. This should encourage pharmacist bodies' educators and regulatory agencies to design initiatives to increase the frequency and quality of practicing pharmaceutical care in community pharmacy.

In this study pharmacists clearly stated pharmaceutical care as an effort and time-consuming process needing experience. Stress and overload in their jobs within one pharmacist-one pharmacy setting hinders pharmaceutical care optimization and thus community pharmacists desire additional time to interact with patients and provide care services to them. Supporting pharmacists with competent technical staff and one or more another pharmacist can facilitate patient care centered practices in community pharmacies. Increasing the use of robotics and technicians are also common strategies to free pharmacists to do more cognitive, patient-centered tasks.

Besides the need for reviewing and updating pharmacist's competence and training, a practical and credible pharmacy practice approach compatible with the local setting of pharmacies is needed to optimize pharmaceutical care in North Cyprus.

## CONSENT

Consent forms were not needed as patient information was not used or needed for this study.

## ETHICAL CONSIDERATIONS

Confidentiality was assured during the study. Ethical approval for this study was obtained from the Institutional Review Board (IRB) of Near East University Hospital (Ref YDU/2015/35-255). The research was conducted in accordance with the Declaration of Helsinki.

IRB Member's background could be accessed from the following link: <http://etikkurul.neu.edu.tr/irb-members/?lang=en>

## ACKNOWLEDGEMENT

This research was supported by the institute of Health Sciences of Near East University. We are also thankful to Assistant Professor Dr. Ozgur

Tosun who provided his expertise that greatly assisted this research.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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*Peer-review history:*

The peer review history for this paper can be accessed here:  
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