

Original Article

PHARMACISTS' KNOWLEDGE AND PERCEPTION REGARDING DIETARY SUPPLEMENTS IN PALESTINE: DESCRIPTIVE STUDY

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ABSTRACT

Objective: To assess pharmacists' knowledge with regards registered dietary supplements DS and their perception toward DS registration by the ministry of health MOH

Methods: A questionnaire was designed to assess pharmacists' knowledge about newly registered food supplements (registered after 2012) and to assess their view about the current measures followed by MOH in registering these supplements. The questionnaire was distributed to pharmacists in West Bank-Palestine during the period from December 2017 to March 2018. Data collected were analyzed using the Statistical Package for Social Sciences program (SPSS) version 10.

Results: Pharmacists' knowledge with regards to registered DS was high with approximately 86% have recorded the right answers. Their perception about the current increasing registration of DS, pharmacists (67%) thinks that 'what available DS in the market' is enough and there is no need for more DS to be registered. Almost half of the pharmacists (48%) think that the information provided regarding dietary supplements is inadequate and almost 30% think is adequate. More than 70% of the pharmacists they never or rarely access the MOH web site to access for information about DS.

Conclusion: This study highlighted the importance of controlling DS registration by the MOH and the necessity to effectively update pharmacists about these DS for effective counseling.

Keywords: Dietary supplements, Pharmacists knowledge, Palestine, Perception

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INTRODUCTION

Dietary supplements [1] are defined by the US Food and Drug Administration (FDA) as any product intended for ingestion to add further nutritional value to conventional food [2]. Dietary supplements come in a variety of forms including tablets, capsules, powders, and solutions. Popular supplements in the market include vitamins; minerals; herbs and some specialty supplements such as fibers, glucosamine, probiotics, and fish oils [2].

Vitamins, minerals, amino acids, enzymes, fibers, and herbal supplements sold in Palestine have been classified and registered by the Ministry of Health under the category of 'dietary supplements' [3]. Since 2012, the number of DS registered in Palestine has increased over the years, with now more than 290 products have been registered [3] and available to consumers. Such an increase has resulted in growing numbers of consumers seeking information about the use, effectiveness, and possible side effects of DS.

Registered DS are sold strictly in community pharmacies dispensed either as over-the-counter medications or by medical scripts. Accordingly, pharmacists need to be aware and updated about all available and newly registered DS to provide effective counseling and dispensing protocols. Registered pharmacists from many countries including Palestine have consistently expressed their need for more knowledge and training in the field of dietary supplements and herbal drugs to cope with growing consumers' concerns about DS [4-6]. Several studies have been designed to assess pharmacists' knowledge and their perception towards dietary supplements in many countries such as Kuwait [7], Saudi Arabia [8], Singapore [9], USA [1, 10], Canada [10], Australia [5], including Palestine [4, 11, 12]. These studies have focused on assessing pharmacists' knowledge regarding the indications, side effects, and pharmacological actions of particular medicinal plants thought to be sold in pharmacies [12].

Despite previous reports assessing pharmacists' knowledge with regards to herbal drugs sold in Palestine [4, 11], these studies were

limited by the fact that they have assessed pharmacists' knowledge on common herbal plants that often do not exist in dosage forms in Palestinian pharmacies. Accordingly, this study was specifically designed to assess community pharmacists' knowledge regarding registered DS present in dosage forms and sold in Palestinian pharmacies, as well as their perception towards the ongoing process of DS registration by MOH.

MATERIALS AND METHODS

Study design, settings and study subjects

This cross-sectional study was designed to assess pharmacists' knowledge and their perception regarding DS and/or their registration by MOH in Palestine. The study was conducted in West Bank-Palestine in the cities of Jerusalem, Ramallah (middle) Hebron, Bethlehem (south), Jenin, Qalqilya, and Nablus (north) and commenced on Dec 2016 till March 2017. A total of 181 pharmacists randomly selected were recruited in the study. All pharmacists recruited in this study were registered Palestinian pharmacists, own a community pharmacy, or employed as a full-time community pharmacist. Pharmacists working in industrial, clinical settings, and/or in academia with no retail experiences were excluded from this study.

Questionnaire

The questionnaire constructed and designed based on the questionnaire reported by Khmour *et al.*, (2018) with modifications to specifically address pharmacists' knowledge and perception with regards to newly registered DS by the Palestinian MOH. The questionnaire was divided into three sections, with section one contains information about pharmacists' demographic information, section two contained nine multiple-choice questions to assess pharmacists' knowledge regarding newly registered DS available in the market, and section 3 contained six statements to explore pharmacists' perception towards DS registration in Palestine. To evaluate pharmacists' knowledge about newly registered DS, nine

different newly registered food supplements (registered after 2015) namely New-Fe-Folic, Reprovit, Herbalis-B, Vitex life, Milk thistle, D-Max, New Nac, Cartina, NT-OX, were selected and multiple-choice questions about their therapeutic use, ingredients, manufacturer, strength, and/or the dosage form were asked. In the third section of the questionnaire, participants were presented with a list of questions related to drugs registered as DS available in the market, the role of MOH in registering DS, and the information available to pharmacists about these DS.

The questionnaire was constructed using Google drive and the final version was printed out and handed in person to community pharmacists. To check for readability and understanding the questionnaire was handed to ten community pharmacists from different educational levels and geographical locations. Their comments were considered before distributing the final questionnaire version.

The data obtained from the collected questionnaire were analyzed using the SPSS software version 21 (IBM, New York). Data for pharmacists' knowledge were categorized into two groups; not correct grouped as '1' or correct grouped as '2' and an independent-

samples T-test and ANOVA was performed for analysis of responders' gender, age, employment status, education level, and area of practice. When the *p*-value was less than 0.05 considered to represent a statistically significant difference. Data related to pharmacists' perceptions were categorized into five different groups; strongly disagree '1', disagree '2', neutral '3', agree '4', strongly agree '5'.

RESULTS

Demographic information

One hundred and eighty-one registered pharmacists in Palestine-West Bank were responded to the survey and all of them were included in the analysis. The demographic information of the pharmacists was summarized in (table 1). Of the 181 pharmacists, 96 (53%) were females and 85 (47%) were males. A 104 (57%) of the pharmacists were at the ages between 20-30 y old. Most of the pharmacists 99 (55%) had a full-time position in community pharmacies and the majority of pharmacists 136 (75%) had a bachelor's degree in pharmacy, with almost 70% recruited pharmacists were graduated from national and Arab universities.

Table 1: Demographic information for participated pharmacists

Gender	Male	85 (47)
	Female	96 (53)
Age group (year)	20-30	104 (57)
	30-40	54 (29)
	40-50	16 (9)
	>50	7 (5)
	Employment status	Full-time
Education	Part-time	82 (45)
	BSc	136 (75)
	Pharm-D	19 (10)
	Master	21 (12)
Country of graduation	PhD	5 (3)
	Palestine	93 (51)
	Jordan	35 (19)
	Egypt	17 (10)
Area of practice	Others	36 (20)
	North	50 (28)
	Middle	48 (26)
	South	83 (46)

Pharmacist knowledge

Overall, pharmacists showed good knowledge regarding registered DS with almost 71% recorded the right answers. The range in percentage of

correct answers to the questions provided was 43-92% with question one related to the "ingredients present in the DS New-Fe-Folic" showed the lowest percentage 43.6% (table 2) and question three "The dosage form of Herbalis-B is" scored the highest correct percentage 92.3%.

Table 2: Pharmacists' knowledge toward registered dietary supplements marketed in palestinian pharmacies (n=181)

#	Questions	1 (No, %)	2 (No, %)
1	What are the ingredients present in New-Fe-Folic	102 (56.4%)	79 (43.6%)
2	The manufacture of Reprovit is	42 (23.2%)	139 (76.8%)
3	The dosage form of Herbalis-B is	14 (7.7%)	167 (92.3%)
4	The dosage form of Vitex life is	81 (44.7%)	100 (55.2%)
5	Milk thistle is mainly used for	35 (19.3%)	146 (80.6%)
6	The dosage form of D-Max is	82 (45.3%)	99 (54.7%)
7	The strength of n-acetylcysteine in New NAC is mg?	22 (12.1%)	159 (87.8%)
8	An alternative drug of Cartia is	29 (16%)	152 (83.9%)
9	The main ingredients in NT-OX caplets are	59 (32.6%)	122 (67.4%)

Pharmacists' knowledge significantly ($P < 0.05$) affected by the area of practice. The average for correct answers scored by pharmacists in the north was 1.82, and in the middle was 1.79 and both were significantly higher compared with south 1.68.

Pharmacist perception

According to the Pharmacists' views about the current measures followed by MOH in registering DS. A 47% of the pharmacists thought that the registered DS in the market are enough, with only 24% thought that are not enough. The majority of pharmacists 68% 'strongly agree' and 'agree' that MOH should register more DS and a 42% of the

pharmacists 'strongly agree' and 'agree' that newly registered food supplements are necessary for public health. A 45% of the pharmacists thought that communication with MOH is effective regarding DS. A 43% of the pharmacists thought that there is a lack of information such as indication, side effect, and activity of newly registered DS. Approximately 71% of the pharmacists rarely or never access the MOH website seeking knowledge about newly registered DS (table 3).

Table 3: Pharmacists' perception about dietary supplements registration

#	Questions	1	2	3	4	5	Mean (SD)
1	Do you think the market has enough drugs registered as food supplements	28 (15.5%)	15 (8.3%)	52 (28.7%)	39 (21.5%)	47 (25.9%)	3.34 (1.36)
2	Do you think the MOH should register more drugs as food supplements	8 (4.4%)	17 (9.4%)	33 (18.2%)	81 (44.7%)	42 (23.2%)	3.73 (1.06)
3	Newly registered food supplements are necessary for public health	12 (6.63%)	28 (15.5%)	65 (35.9%)	50 (27.6%)	26 (14.4%)	3.28 (1.10)
4	Do you think the communication with MOH is effective regarding the food supplements	30 (16.6%)	28 (15.5%)	42 (23.2%)	60 (33.1%)	21 (11.6%)	3.08 (1.27)
5	Do you think there is a lack in information about newly registered food supplements, indications, side effects	26 (14.4%)	29 (16%)	49 (27.1%)	62 (34.3%)	15 (8.3%)	3.06 (1.19)
6	Do you access the MOH web site to get details about registered food supplements	100 (55.2%)	27 (14.9%)	27 (14.9%)	17 (9.4%)	10 (5.5%)	1.95 (1.26)

1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree

DISCUSSION

The majority of pharmacists (>70%) in Palestine have reported to dispense and provide counseling about DS [11]. Such percentage has increased since 2013 due to their ability to treat a wide range of chronic and terminal diseases, the increased demands on DS by the public, and also the ongoing process of registration of new DS leading to an increase in the numbers and the variety of DS. In this study, all recruited pharmacists from 181 different pharmacies located in various cities in Palestine reported dispensing DS. Most DS in Palestine are imported with manufacturers and/or importers of DS are often excluded from many regulations and details that normally are associated with conventional therapy registration. Accordingly, pharmacists, since they are the primary provider for DS, are obligated to have an excellent up-to-date knowledge with regards to DS.

Pharmacists are a key source of information for patients seeking guidance about the use, safety, and efficacy of DS [13-15]. This study was the first to assess pharmacists' knowledge with regards to DS that have been registered and sold in Palestine. Pharmacists, overall, showed a good level of knowledge regarding registered DS (>70% of the pharmacists have answered questions 2-9 correctly). Such good knowledge can be attributed to a limited number of registered DS (180 products) sold in the market at the time of conducting this study, the 1440 h pharmacy training, as well as the knowledge gained by studying courses such as pharmacognosy and phytochemistry during their studies. It is worth noting that these courses are mandatory in all Palestinian universities as well as in most Arab universities and have been eliminated from many universities around the world [16, 17]. Previous studies carried out to assess pharmacists' knowledge with regards to herbal drugs in Palestine [4, 11, 12] were designed to address pharmacists' knowledge with regards to the use, side effects, herb-drug interactions of herbal plants that often did not have any dosage forms registered in Palestine at the time have been carried out.

Pharmacists' knowledge was significantly affected by the area of practice. Pharmacists in the north and middle showed a significantly higher level of knowledge with regards to DS compared with the south. Pharmacists in Palestine appear to rely heavily on companies' representatives' visits to their pharmacies to get information about DS and to lesser extend on depending on what has been written on the package of the DS. The major factors contributing to lesser knowledge in DS among the pharmacists in southern cities include the fact that major governmental bodies including MOH and pharmaceutical companies are located in the middle and northern cities, the difference in the socioeconomic status of the population, and the difference in the intensity of the promotion for DS between the various parts of Palestine.

Nowadays, it has become common practice in Palestine not to dispense or provide effective counseling regarding scripts from doctors containing newly registered DS. Such a problem is more evident in rural pharmacies than urban pharmacies likely due to the variations in DS companies' promotional behaviors. In this study, pharmacists in Palestine (>70%) rarely accessed the MOH web site

seeking information about DS. Information such as therapeutic activity recommended daily dose, possible side effects, indications, and contraindications are not included in the MOH web site and often not provided with DS package. MOH usually provides up-to-date information about DS trade name, date of registration, active ingredients, dosage form, and manufacturer and/or distributor. Such information could be of little impact during pharmacist's counseling and this could be a major factor why most Palestinian pharmacists showed little interest in finding information about registered DS using the MOH web site. Similar trends showing the lack of reliable sources of information regarding DS have been reported in the USA [18, 19] and Saudi Arabia [20]. Therefore, pharmacists' knowledge could decline in near future due to the ongoing and uncontrolled registration process of new DS by MOH continues, not including useful information about newly registered DS on MOH web site, and not improving the marketing policies of the newly registered DS.

Limitations of this study include the fact that pharmacists' knowledge and perception were assessed at a single-time-point where a limited number of registered DS was available at the time of conducting the study. So caution must be taken when interpreting these results. Moreover, the 181 community pharmacists from different pharmacies were randomly selected. These represent 19.2% of the total accessible pharmacies in Palestine. Such sample size may not be representative of the whole pharmacists and a larger sample size may be needed. Despite these limitations, this study reflects the importance of providing, educating, and keeping community pharmacists updated about registered DS to provide effective counseling and patient care.

CONCLUSION

Community pharmacists in Palestine should be effectively informed about newly registered DS. Accordingly, MOH and companies' representatives collaboratively should provide comprehensive information to community pharmacists regarding the newly registered DS for better dispensing and counseling protocols in Palestinian pharmacies.

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AUTHORS CONTRIBUTIONS

AQ and BY designed the questionnaire in collaboration with AK, who made the analysis. AQ drafted the article and all other authors have revised it. All authors have read the final version and approved it. AQ and AK have full access to all related data.

CONFLICTS OF INTERESTS

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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