Al-Rafidain J Med Sci. 2024;6(1):20-24.
DOI: https://doi.org/10.54133/ajms.v6i1.413

AJMS

Online ISSN (2789-3219)

Research Article

Proficiency and Knowledge of Community Pharmacists in the Use of Liraglutide and Semaglutide as Weight Reduction Agents

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Received: 24 November 2023; Revised: 27 December 2023; Accepted: 2 January 2024

Abstract

Background: In recent years, the prevalence of obesity has climbed sharply. Still, only a few safe and effective medications are approved as weight-loss drugs. ***Objective***: This study aims to assess the knowledge and practice of community pharmacists in Iraq regarding the use of Liraglutide and Semaglutide as weight-loss medications. ***Method***: A cross-sectional survey was implemented using a validated questionnaire and a convenient sample of Iraqi community pharmacists from different governorates. The questionnaire was created after conducting a literature review of the most important articles about liraglutide and semaglutide. The questionnaire consists of three sections. The first part was used to collect demographic information. The second and third parts assessed community pharmacists' knowledge and practice of the anti-diabetic weight-loss agents Liraglutide and Semaglutide, respectively. ***Results***: A total of 225 community pharmacists participated in this survey. The mean number of successfully answered knowledge questions by all participants was 15 out of 20, indicating a good knowledge of the Iraqi community pharmacists regarding using Liraglutide and Semaglutide as weight-loss medications. The current study revealed that the mean score for the practice section is 3.97, indicating that the participating pharmacists have good practice regarding using these medications. ***Conclusions***: Community pharmacists have demonstrated adequate knowledge about correct administration escalation, storage, adverse effects, and other aspects of using Liraglutide and Semaglutide for weight loss. There is a knowledge gap between younger and older pharmacists.

Keywords: Community pharmacists, Knowledge, Liraglutide, Practice, Semaglutide, Weight reduction agents.

معرفة وممارسة صيادلة المجتمع بخصوص استخدام ليراجلوتايد وسيماجلوتايد كعقاقير لإنقاص الوزن

الخلاصة

الخلفيّة: خلال السنوات الأخيرة، تصاعد انتشار فرط السمنة بوتيرة حادة، ولا يوجد سوى القليل من الأدوية الآمنة والفعّالة المقرّة لانقاص الوزن. **الهدف**: تقييم معرفة وممارسة صيادلة المجتمع في العراق بخصوص استخدام ليراجلوتايد وسيماجلوتايد كأدوية لإنقاص الوزن. **الطريقة**: تم إجراء دراسة مقطعيّة من خلال استبيان تحقّقت صلاحيته، مع اختيار عيّنة مناسبة من صيادلة مجتمع عراقيّين. تمّت كتابة الاستبيان بعد مراجعة أهم المصادر والمقالات العلميّة المتعلّقة بليراجلوتايد وسيماجلوتايد. يتألّف الاستبيان من ثلاثة أقسام، يهدف القسم الأوّل لجمع المعلومات الديموغرافيّة للمشاركين، بينما يهدف القسمان الثاني والثالث لتقييم معرفة وممارسة صيادلة المجتمع بخصوص عقاقير داء السكّري المقرّة لإنقاص الوزن. **النتائج**: بلغ العدد الكلّيّ للصيادلة المشاركين بالاستبيان 225. معدّل الإجابات الصحيحة على الأسئلة المتعلّقة بقسم المعرفة هو 15 من أصل 20 سؤالًا، هذا يشير لجودة معرفة صيادلة المجتمع بخصوص استخدام ليراجلوتايد وسيماجلوتايد كأدوية لإنقاص الوزن، بينما كان معدّل الأسئلة المتعلّقة بقسم الممارسة 3.97، والّذي يشير إلى صحّة ممارسة المشاركين بخصوص استخدام هذه الأدوية. **الاستنتاج**: أظهر صيادلة المجتمع معرفة جيّدة حول الاستخدام الصحيح، وزيادة الجرعة، والخزن، والآثار الجانبية، وغيرها من الجوانب المتعلّقة باستخدام ليراجلوتايد وسيماجلوتايد لإنقاص الوزن. هناك فجوة معرفيّة بين الصيادلة الأصغر والأكبر سنًّا، يمكن للبرامج التعليميّة والحلقات الدراسيّة المساعدة بتقديم معلومات جديدة للصيادلة من مختلف الفئات العمريّة، ومساعدة الصيادلة الأكبر سنًّا والأكثر خبرةً للحفاظ على المعلومات المكتسبة مسبقًا.

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Article citation: Mohammed SI, Al-Samiry AH, Khalaf NM. Proficiency and Knowledge of Community Pharmacists in the Use of Liraglutide and Semaglutide as Weight Reduction Agents. *Al-Rafidain J Med Sci.* 2024;6(1):20-24. doi: https://doi.org/10.54133/ajms.v6i1.413

INTRODUCTION

Obesity and diabetes are rising, which remains an ongoing health concern worldwide. It is important to consider the weight effects of anti-diabetic agents prior to initiation, as different anti-diabetic agents impact weight differently [1]. With the removal of lorcaserin from the market in 2020, the Food and Drug Administration (FDA) has approved only five drugs for long-term weight management: orlistat, phentermine-topiramate, naltrexone-bupropion, liraglutide, and most recently, one brand of semaglutide (Wegovy®) [2]. It has been suggested that glucagon-like peptide-1 receptor agonists (GLP-1RA) aid in weight loss in diabetes patients. These drugs, frequently categorized as incretin mimetics, are gaining popularity as a type 2 diabetes mellitus (T2DM) treatment option since they cause a moderate hemoglobin A1c decrease along with weight loss [3]. Liraglutide has been available to patients for the longest period of time among GLP-1 RA, which explains the diversity of data utilized to evaluate this agent. In 2015, researchers performed a meta-analysis on adult T2DM patients with a body mass index (BMI) of over 25 kg/m^2. They found that when different doses of liraglutide were 1.2 mg daily and 1.8 mg daily, both doses resulted in greater weight loss than placebo [3]. Semaglutide is an oral form of the GLP-1RA that is approved for treating T2DM in adults in the US, Canada, and Europe [4,5]. It was created to get around some of the problems that come with injectable therapy. By eliminating the injectable barrier for patients and healthcare providers, oral semaglutide provides a new option that may promote the timely use of GLP-1RA in individuals with T2DM [4]. Based on four Phase 3 trials, the safety and effectiveness of putting 2.4 mg of Semaglutide under the skin once a week in 5000 overweight or obese people were compared. The results indicated that those who received semaglutide experienced a dose-dependent reduction in body weight from baseline. Receiving subcutaneous Semaglutide, a greater proportion of subjects lost 5–10% of their initial body mass [2]. The 2.4 mg dose of semaglutide is licensed for treating obesity, and the monthly titration is advised to improve tolerance and reduce gastrointestinal side effects [6]. Community pharmacy allows the public to access their medications and seek advice regarding their health. Pharmacists practicing in these community pharmacies are well-positioned to promote healthy weight and/or implement weight management interventions [7]. Additionally, patients regard pharmacists as suppliers of health advice, and those who have received such advice have been quite satisfied, despite varying perceptions of pharmacists' abilities [8]. Therefore, national health bodies and professional organizations must guarantee that weight management treatments provided by pharmacists are backed by current clinical evidence and best practice principles [8]. According to our work experience in community pharmacies, the use of these medications as weight loss agents has expanded in Iraq, and most patients take these medications straight from the pharmacy; therefore, the pharmacist may play a crucial role in educating patients on the proper use of these medications. Accordingly, this study aims to assess the knowledge and practice of community pharmacists in Iraq regarding the use of Liraglutide and Semaglutide as weight-loss medicines.

METHODS

Study design and sampling

A cross-sectional survey was conducted on a convenient sample of Iraqi community pharmacists from different governorates. After being informed of the purpose and methods of the study, verbal consent was obtained from each participant identified as a possible respondent. Numerous community pharmacists from various pharmacies and areas in Iraq were sent the questionnaire. Paper-based questionnaires were implemented for data collection, in addition to a Google Form of the questionnaire, which was designed and posted in private and professional Facebook groups in order to reach respondents from different regions of Iraq. On average, completing the survey did not take more than 15 minutes.

Ethical approval

Ethical approval was obtained from the local Scientific and Ethical Committee in the College of Pharmacy, University of Baghdad. Furthermore, verbal consent was obtained from each participant identified as a possible respondent.

Inclusion criteria

Licensed pharmacists that worked in community pharmacy for at least six months. Licensed pharmacists who were still working in a community pharmacy at the time the study took place.

Exclusion criteria

Pharmacists who have previously worked as medical representatives for liraglutide or semaglutide.

Data Collection

The first author created a questionnaire after conducting a literature review on the most important information about liraglutide and semaglutide. It was validated using the test-retest and Cronbach alpha reliability estimates. Cronbach alpha was (0.796) for the knowledge parts and (0.715) for the practice parts, indicating an acceptable level of internal consistency. Furthermore, the test-retest reliability correlation of (0.93) or greater showed good reliability. The questionnaire contained three distinct sections, all written in English. The first section was to collect demographic data. The second and third sections assessed community pharmacists' knowledge and practice of anti-diabetic weight-loss medications.

The knowledge component contained twenty questions, and each correct response was worth one point. Based on this, the total knowledge points were discovered and then categorized as low (less than 12 points), average (12–14 points), good (14–16 points), very good (16–18 points), and excellent (more than 18 points). In the practice part, a 5-point Likert scale was utilized, which used the following values: Always = 5, frequently = 4, occasionally = 3, infrequently = 2, and never = 0 will be the scale point rankings. The data was interpreted as follows: very poor = 0-1.5, poor = 1.51-2.5, moderate = 2.51-3.5, good = 3.51-4.5, excellent = 4.51-5.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) software version 26 was used to analyze the data. The mean of the values for continuous variables was used. Percentages and frequencies were used to represent categorical variables. A probability of less than 0.05 was deemed significant. The findings were normalized using the Shapiro-Wilk test. In the study, Spearman correlation was utilized to examine the relationship between knowledge and practice and demographic characteristics.

RESULTS

A total of 225 community pharmacists participated in this survey. Seventy-two participants were males, and 153 were females. Participants' ages ranged from 24 to 50 years, with a mean of 26 years.

Table 1: Demographic data of the participants

Variable	Category	Frequency(%)
Gender	Male	72(32)
	Female	153(68)
Degree	BSc	213(94.67)
	Master	2(0.89)
	PhD	9(4)
	Diploma	1(0.44)
Pharmacy location	Rural	14(6.22)
	Urban	211(93.78)
Age (year)		26±4.3
Experience in a community pharmacy (year)		3.21±3.43
Experience in a hospital (year)		2.24±2.81

Results are reported as mean±SD or frequency (percentage); BSc: Bachelor of Sciences; PhD: Doctor of Philosophy.

As stated in Table 1, the majority of participants (213) hold bachelor's degrees in pharmacy, 2 hold a master's degree, 9 hold a Doctor of Philosophy, and only one holds a diploma degree. Fourteen of them work in pharmacies located in rural areas, while 211 are in urban locations. The mean number of successfully answered knowledge questions by all participants was 15 out of 20 questions; the number and percentage of correct answers are stated in Table 2.

Table 2: Knowledge of community pharmacists regarding the use of Liraglutide and Semaglutide as weight management agents

Questions about knowledge	Correct answer	Response *n*(%)
Did the U.S. Food and Drug Administration approve Semaglutide (Ozempic) anti-diabetic as an agent for weight reduction?	No	131(58.2)
Did the U.S. Food and Drug Administration approve Liraglutide (Saxenda) anti-diabetic as an agent for weight reduction?	Yes	191(84.89)
Liraglutide belongs to which class?	GLIP-1R agonist	186(82.67)
Semaglutide belongs to which class?	GLIP-1R agonist	180(80)
The starting dose of Liraglutide for weight reduction is?	0.6 mg	176(78.22)
The starting dose of Semaglutide for weight reduction is?	0.25 mg	161(71.56)
The maximum dose of liraglutide for weight loss is?	3 mg	165(73.33)
The maximum dose of subcutaneous Semaglutide for weight loss is?	2.4 mg	132(58.67)
Should the dose of Liraglutide or Semaglutide be increased weekly according to a fixed escalation schedule?	Yes	184(81.78)
Should the dose of Liraglutide or Semaglutide be administered subcutaneously to the abdomen, thigh, or upper arm?	Yes	215(95.56)
The dose of Semaglutide should be administered once weekly, on the same day each week?	Yes	189(84)
Could the Dose of Liraglutide or Semaglutide be given at any time of the day, without regard to the meal?	Yes	144 (64)
The use of Liraglutide or Semaglutide could be initiated in any overweight patients without considering the BMI?	No	147 (65.33)
If the dose is missing for liraglutide, resume the once-daily regimen with the next scheduled dose; do not give an extra or higher dose.	Yes	177 (78.67)
Unused injectable pens should be refrigerated at 2-8°C (36-46°F) and must not be frozen?	Yes	215(95.56)
Used injectable pens could be stored at room temperature (25 °C)?	Yes	124(55.11)
Used injectable pens must be discarded 30 days after the first use?	Yes	155(68.89)
There is no limited duration of use of these drugs as weight-reduction agents	Yes	136(60.44)
Both Liraglutide and Semaglutide are contraindicated in patients with multiple endocrine neoplasia.	Yes	165(73.33)
Is nausea the most common adverse effect associated with these medications?	Yes	202(98.54)

Note: Total participant number = 225; BMI: Body Mass Index

As seen in Table 3, the current study revealed that the mean score for the practice section is 3.97, indicating that the participating pharmacists have good practice regarding using these medications.

As shown in Table 4, there was a significant correlation between the age of the participants and their knowledge and no significant correlation with their practice.

Table 3: Practice of community pharmacists regarding dispensing Liraglutide and Semaglutide

Questions regarding practice	Response (out of 5)
When you dispense the pen, do you educate patients about the proper use of the Pen?	4.08
When you dispense the pen, do you educate the patients about the correct administration time?	3.83
When you dispense the pen, do you educate the patients about the correct storage of the pen?	4.31
When you dispense the pen, do you educate the patients about the side effects?	3.66

Note: Total participant number = 225.

Regarding the years of experience in community pharmacy, there was a significant correlation between the participants' knowledge and no significant correlation with their practice. There was no significant correlation between hospital experience years and the participants' knowledge or practice.

Table 4: Correlation of knowledge and practice with demographic variables

Parameters		Correlation coefficient	*p*-value
Age	Knowledge	-0.237	0.000
	Practice	0.016	0.807
Experience in a hospital	Knowledge	0.064	0.343
	Practice	0.066	0.324
Experience in a community pharmacy	Knowledge	-0.206	0.002
	Practice	0.020	0.769

Note: Spearman correlation was used to examine the correlation because the data were not linearly distributed.

DISCUSSION

Many studies have suggested a serious lack of knowledge among healthcare professionals, including pharmacists, regarding injectable diabetes medications and weight reduction agents [9–11]. The emerging picture from our results has suggested otherwise, as pharmacists have demonstrated good knowledge regarding anti-diabetic weight management agents. The current study's mean number of correctly answered questions is 15 out of 20. To the best of our knowledge, this is the first study in Iraq to evaluate the knowledge and practice of community pharmacists regarding the use of liraglutide and semaglutide for weight reduction. Almost all participants knew nausea was the most common adverse effect of both liraglutide and semaglutide. A systematic, prospective case-note study conducted in Europe showed that most cases that ended with liraglutide withdrawal were due to gastrointestinal adverse effects [12]. It is important to inform patients about expected adverse effects, as it makes them more actively involved in the surveillance of their therapy. This can minimize non-adherence, as patients will not experience any effect beyond their expectations. Regarding the indication of these agents for weight management, most participants are aware that liraglutide is FDA-approved for this indication, and nearly half of the participants mistakenly believed semaglutide was also approved for this indication. The fact that another semaglutide brand, Wegovy®, is not available in Iraq but has FDA approval for weight management [13] contributes to the confusion that has resulted. Participants have also shown excellent knowledge regarding the route and site of administration, which can help reduce injection site reactions, and regarding the storage of unused pens; however, a large percentage did not know that used pens can be stored at room temperature. The lack of this information has no significant consequences, as used pens can be refrigerated or stored at room temperature [14]. There is a knowledge gap when it comes to the treatment timescale, as nearly 40% of participants believed that there is a limited duration for the use of these medications for weight management, but similar to other weight management agents, Liraglutide and Semaglutide are designed for long-term treatment alongside a healthy diet and routine exercise [15]. An Italian retrospective study that found that long-term treatment with Liraglutide produces lasting weight loss results, especially for women [16], emphasizes this. According to the results of the current study, participants have stated that they have good practices related to patient education about the proper use of these agents. This is consistent with a previous study conducted in Iraq that involved a sample of community pharmacists, which demonstrated that community pharmacists in Iraq had an optimistic view of patient counseling [17]. Since pharmacists are usually the easiest to reach medical professionals, these results are good news because they show how important it is for pharmacists to teach patients about self-injecting medications. This was shown in a randomized, controlled, multi-centered study in Malaysia, where pharmacists provided intensive education that led to big improvements in insulin injection technique, adherence, and ultimately, success rates. Our correlation results show that younger participants with less experience working in a community pharmacy are surprisingly more knowledgeable. One reason could be the fact that the indication of these agents for weight management is fairly recent, with liraglutide being FDA-approved in 2014 [19]. Another possible reason is that younger participants can have a better recollection of specific information compared to older participants, who may have more cluttered memories of the larger, more varied amount of information they gained through the years; this is agreeable with what was reported in a descriptive cross-sectional study conducted in Ethiopia, where pharmacists younger than 30 years old demonstrated better knowledge toward pharmaceutical care than their older counterparts [20].

Study limitations

There are certain restrictions with this study. Because it was so difficult to find interested participants who fit the inclusion criteria, we were unable to meet the predicted sample size. The inability to recruit enough participants from remote areas to create a clear picture of the importance of pharmacy location is another

recruitment-related issue. As a result, the findings of the pharmacy location question were excluded from our statistics.

Conclusion

Concerning the proper dosage, escalation, storage, side effects, and other matters pertaining to the use of liraglutide and semaglutide for weight management, community pharmacists have demonstrated good understanding and effective practice. Regarding how long a treatment should last, which agents are utilized off-label and which are FDA-approved for a specific indication, more education is needed. Between younger and older pharmacists, there is a knowledge gap to some extent. Workshops and educational programs can help younger pharmacists learn new material while helping more seasoned pharmacists maintain knowledge they already possess.

Conflict of interests

No conflict of interests was declared by the authors.

Funding source

The authors did not receive any source of fund.

Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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