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RESEARCH ARTICLE

Knowledge, Attitude and Practice about Glucagon-like Peptide-1 Receptor Agonist Among the Physicians of Prince Mohammed bin Abdulaziz Hospital & Primary Health Care, National Guard, Saudi Arabia

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ABSTRACT

Glucagon-like peptide-1 receptor agonist (GLP-1RA) is a newly approved medication in the management of Diabetes Mellitus. GLP-1RA has potential adverse effects and risks such as gastrointestinal symptoms, pancreatitis, and thyroid cell neoplasia, respectively. A cross-sectional study, through a validated questionnaire with fixed answers, was utilized to assess the physician's response regarding GLP-1RA. Participants were Saudi females, younger than 35 years. Physicians with variable educational degrees were included. In regard to prescription authority, it was limited to only around 25.5% of the treating physicians. Knowledge items were scored correctly by 77.2% of participants. And around half of the group 51.6% showed a positive attitude toward GLP-1RA, reflected as strongly agree and agree in the questionnaire. And only 55.2% of participants showed good practice in terms of utilization of GLP-1RA. These findings suggest that continuous professional development and well-organized training programs are crucial to bridge knowledge gaps and refine practice patterns.

Keywords: Knowledge; Attitude; Practice; Glucagon-like peptide-1 receptor agonist; Physicians

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by abnormal glucose metabolism, which requires continuous medical treatment, patient education and self-management support to avoid long-term complications[1]. Despite consistently evolving effective interventions, it remains to have a significant impact on patients' quality of life. DM is a major cause of disability and increased mortality[2]. Management of diabetes mellitus is difficult and involves number of different approaches and interventions including tight glycemic control to minimize the risks associated with persistent hyperglycemia. Throughout the previous several decades, the prevalence of diabetes has been growing, which has been spurred by the worldwide growth in the prevalence of obesity. The amount spent on medical treatment throughout the world to treat DM has exceeded USD 727 billion[3]. According to the World Health Organization (WHO), Saudi Arabia has the second highest diabetes rate in the Middle East and the seventh highest rate in the world. The health burden that caused by DM should be managed with a multidisciplinary approach and a wide-ranging epidemic control program that should be incorporated, with a great emphasis on advocating a healthy diet, exercise, active lifestyles and maintaining a healthy weight[1]. In our current practice there are several groups of anti-diabetic medicines are available, such as sulphonylureas, biguanides, meglitinides, thiazolidinediones, alpha-glucosidase inhibitors, inhibitors, and glucagon-like peptide 1 receptor agonists (GLP-1 RA)[4]. In healthy individuals, incretins have a major role in glucose hemostasis. They are released from the gastrointestinal tract in response to meal ingestion which stimulates pancreatic insulin secretion in a glucose-dependent manner[5]. GLP-1 has been shown to inhibit gastric emptying, thereby slowing

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the intestinal absorption of nutrients after ingestion [6,7]. Also, they decrease appetite and food intake via stimulation of anorexigenic neural pathways [8]. Furthermore, GLP-1 suppresses inappropriately high postprandial levels of glucagon [9,10]. Additionally, GLP1 associated with low risk of hypoglycemia. Gastrointestinal symptoms are common but transient and they are associated with weight loss rather than weight gain [11]. The safety profile indicates administration of GLP-1 can cause pancreatitis, local irritation, gastric upset and can increase the risk of thyroid C-cell neoplasia. They are contraindicated in pregnancy and lactating mothers as the safety profile in these patients is unclear and incomplete which necessitates further conclusive evidence [12]. On the other hand, GLP-1RA reduced the risk factors of diabetic retinopathy [13]. The study of Knowledge, attitude, and practice (KAP) about diabetes medications have received little research interest. It has been shown that insufficient KAP affects the management process for chronic disorders like diabetes [14]. In India, it was shown that patients had a significantly decreased knowledge regarding the role of injectable medication in the management of diabetes mellitus [15]. On the other hand, another study among healthcare professionals in Qassim University found good knowledge, attitude, and appropriate use of the GLP-1 RA [16]. It is essential to assess KAP of health care workers regarding new era of DM management by conducting a good scientific survey and statistically analyzing their responses. This study designed to give valuable information for the establishment of measures to improve the medical information and clinical practice among practitioners. Therefore, the purpose of this paper is to assess the KAP of GLP-1 RA among physicians of Prince Mohammed bin Abdulaziz Hospital and primary health care.

METHOD

The main objective of the study is to assess the knowledge and measure the professional attitude and practice of physicians of prince Mohammed bin Abdulaziz hospital and primary health care about GLP-1RA in DM management. The study ethically approved by King Abdullah International Medical Research Center (KAIMRC) – western region (IRB\2453\23). This was a cross-sectional questionnaire-based survey. The questionnaire was divided into two parts: socio-demographic section and KAP section. In sociodemographic data, information about the participants such as age, gender, nationality, department, qualification, specialization, years of experience and prescription authority was obtained. In KAP data, questions related to knowledge had fixed answers such as 'Yes', 'No' and 'Don't know'. Also, questions about the attitude and practice had the fixed answers such as 'Strongly agree', 'Agree', 'Neutral', 'Disagree' and 'Strongly disagree'.

Scoring Methods

The assessment composed of a total of 26 items across three domains: knowledge, attitude, and practice (**see supplementary figure 1**). Specifically, there were 13 items related to knowledge, 6 items pertaining to attitudes, and 7 items concerning practices. The knowledge score was assessed by summing the "Yes" responses to a set of 13 questions related to GLP-1 RA therapy. Participants received a score of +1 for each correct response, -1 for incorrect responses, and 0 for 'don't know'. This resulted in a total score range of +13 to -13. Higher scores indicating a greater level of knowledge about GLP-1 RA therapy. Attitudes were evaluated based on a scale where 'Strongly agree' was assigned a score of +2, 'Agree' received +1, 'Neutral' was scored as 0, 'Disagree' was -1, and 'Strongly disagree' was -2, leading to a score range from -12 to +12. Similarly, the practice domain used the same scoring system, resulting in scores ranging from -14 to +14. Categorization of responses was done based on the percentage scores, with scores above 70% categorized as 'Good', those between 51% and 69% as 'Fair', and scores less than 50% recorded as 'Poor'.

Statistical Analysis

The statistical analysis was conducted using RStudio software (R version 4.3.1.). Descriptive statistics were utilized to summarize demographic and occupational characteristics, including frequencies and percentages for categorical variables. Statistical differences in demographic and occupational characteristics across participants' knowledge, attitude and practice levels regarding GLP-1 RA were assessed using Fisher's exact test. Statistical significance was set at $p < 0.05$. Additionally, inferential analysis was performed using the Wilcoxon rank sum test and Kruskal-Wallis rank sum test for the overall knowledge score. Multivariable regression analysis was employed to examine factors associated with the knowledge score, with beta coefficients and 95% confidence intervals (CIs) reported. Statistical significance was set at $p < 0.05$.

RESULTS

Demographic and occupational characteristics

The responses of a total of 51 participants were analyzed in the current study. About a half of physicians surveyed were female (51.0%), and most of them were Saudis (98.0%). Most participants were aged less than 35 years (92.2%) and had educational qualifications ranging from residents (45.1%) to Medicine bachelor, Bachelor of Surgery, MBBS, (41.2%). Internal medicine was the predominant department (58.8%), with the majority of physicians specializing as internal medicine residents (54.0%). Additionally, a significant proportion of respondents had less than or equal to 2 years of experience (62.7%). Notably, a majority of

physicians reported not having authorization for GLP-1 RA prescription (72.5%) [Table 1].

Table 1: Demographic and occupational characteristics

Characteristic	N=51
Gender	
Male	25 (49.0%)
Female	26 (51.0%)
Nationality	
Saudi	50 (98.0%)
Non-Saudi	1 (2.0%)
Age (Years)	
Less than 35	47 (92.2%)
36 to 45	1 (2.0%)
45 to 55	2 (3.9%)
Above 56	1 (2.0%)
Educational Qualification	
Resident	23 (45.1%)
MBBS**	21 (41.2%)
Board-certified	7 (13.7%)
Department	
Family medicine	21 (41.2%)
Internal medicine	30 (58.8%)
Specialization*	
General Practice	4 (8.0%)
Family medicine resident	11 (22.0%)
Internal medicine resident	27 (54.0%)
Senior registar	7 (14.0%)
DM fellow	1 (2.0%)
Year(s)of Experience	
≤2	32 (62.7%)
>2 to 5	15 (29.4%)
> 5	4 (7.8%)
Authorization of GLP-1 RA prescription	
No	37 (72.5%)
Yes	13 (25.5%)
Do not know	1 (2.0%)

n (%)
*The variable had one missing value
** Medicine bachelor, Bachelor of Surgery

Knowledge about GLP-1 RA and the associated factors

Out of a total score of 13, the median (IQR) knowledge score across all the participants was 10.0 (8.0 to 11.00). Among the factors associated with the knowledge score among participants, significant differences were observed in terms of department (p = 0.010) and specialization (p = 0.024) and years of experience (p = 0.027). On the multivariable regression model comprising the significantly associated variables of knowledge, physicians specializing as family medicine residents exhibited a higher knowledge score compared to those in general practice, with a beta coefficient of 3.34 (95% CI, 0.31 to 6.36, p = 0.037). Additionally, physicians with 2 to 5 years of experience showed a significantly higher knowledge score compared to those with less than or equal to 2 years of experience, with a beta coefficient of 1.72 (95% CI, 0.11 to 3.34, p = 0.043) [Table 2].

Participants' responses to knowledge, attitudes, and practice items (see supplementary tables 1 and 2) .

Overall Description of KAP categories

In the knowledge category, approximately 31.4% of participants were categorized as having a fair level of knowledge, while nearly half, or 49.0%, were classified as having a good understanding. About 19.6% of respondents fell into the poor knowledge category. Regarding attitudes, a smaller proportion, at 17.6%, were rated as fair, while 19.6% were classified as having a good attitude. However, the majority, comprising 62.7%, exhibited a poor attitude response. In the practice category, a similar pattern emerged, with 17.6% categorized as fair, 23.5% as good, and the majority, around 58.8%, as poor (Figure 1). In general, knowledge items were scored correctly in 77.2% of participants. And around half of the group 51.6% showed a positive attitude toward GLP-1RA, reflected as strongly agree and agree in the questionnaire. And only 55.2% of participant showed good practice in term of utilization of GLP-1RA.

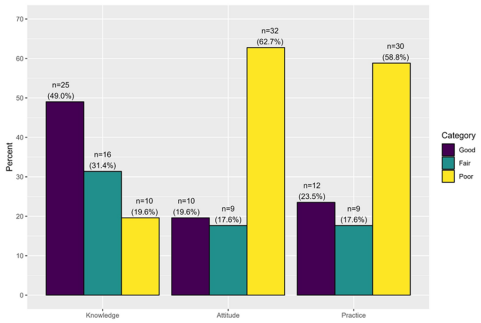

Fig. 1: Description of the overall knowledge, attitude, and practice among participants

Statistical differences between knowledge levels

Statistically significant differences were observed in the distribution of knowledge levels among participants based on their department (p = 0.041) and specialization (p = 0.042). Specifically, within the department variable, a higher proportion of respondents from the family medicine department demonstrated a good level of knowledge (66.7%), compared to those from internal medicine (36.7%).

Table 2: Factors associated with the knowledge score among participants

	Inferential analysis		Multivariable regression		
Characteristic	**Median (IQR)**	**p-value**	**Beta**	**95% CI**	**p-value**
Gender		0.163			
Male	9.00 (7.00, 11.00)				
Female	10.00 (8.25, 11.00)				
Nationality		0.371			
Saudi	10.00 (8.00, 11.00)				
Non-Saudi	11.00 (11.00, 11.00)				
Age (Years)		0.243			
Less than 35	9.00 (8.00, 11.00)				
36 to 45	10.00 (10.00, 10.00)				
45 to 55	11.50 (11.25, 11.75)				
Above 56	11.00 (11.00, 11.00)				
Educational Qualification		0.063			
Resident	9.00 (7.50, 10.50)				
MBBS	10.00 (8.00, 11.00)				
Board-certified	11.00 (10.50, 11.00)				
Department		0.010			
Family medicine	11.00 (10.00, 11.00)				
Internal medicine	8.50 (7.00, 10.00)		0.32	-2.93, 3.57	0.849
Specialization		0.024			
General Practice	8.00 (7.50, 8.75)				
Family medicine resident	10.00 (9.50, 11.00)		3.34	0.31, 6.36	0.037
Internal medicine resident	8.00 (7.00, 10.00)		1.06	-2.04, 4.17	0.506
Senior registrar	11.00 (10.50, 11.50)		2.04	-0.66, 4.74	0.146
DM fellow	10.00 (10.00, 10.00)		1.77	-3.05, 6.59	0.475
Year(s)of Experience		0.027			
≤2	9.00 (7.00, 11.00)				
>2 to 5	10.00 (8.00, 11.00)		1.72	0.11, 3.34	0.043
> 5	11.00 (11.00, 11.25)		3.21	-0.25, 6.67	0.076
Authorization of GLP-1 RA prescription		0.159			
No	9.00 (8.00, 10.00)				
Yes	11.00 (10.00, 11.00)				
Do not know	10.00 (10.00, 10.00)				

IQR: interquartile range, CI: Confidence Interval, MBBS: Medicine bachelor-Bachelor of Surgery. Wilcoxon rank sum test; Kruskal-Wallis rank sum test.

Regarding specialization, participants categorized as senior registrars showed the highest percentage of good knowledge (100.0%), followed by family medicine residents (63.6%), while the lowest proportion was observed among internal medicine residents (33.3%) and DM fellows (0.0%) [Table 3].

Statistical differences between attitude levels:

Statistically significant differences were found in attitude level towards GLP-1 RA among participants based on gender (p = 0.019). Specifically, a higher proportion of female participants exhibited a good attitude (34.6%) compared to male participants (4.0%), who had a larger proportion categorized under the poor attitude level (76.0%) [Table 4].

Statistical differences between practice levels

Statistically significant differences were observed in practice level related to GLP-1 RA among participants based on their educational qualification (p = 0.034). Notably, a higher proportion of participants with board certification demonstrated a good practice (71.4%) compared to those with MBBS (14.3%) or residency qualifications (13.0%) [Table 5].

Table 3: Statistical differences between knowledge levels

		Knowledge level			
Characteristic	**Missing**	**Good N=25**	**Fair N=16**	**Poor N=10**	**p-value**
Gender	0 (0%)				0.662
Male		11 (44.0%)	8 (32.0%)	6 (24.0%)	
Female		14 (53.8%)	8 (30.8%)	4 (15.4%)	
Nationality	0 (0%)				>0.999
Saudi		24 (48.0%)	16 (32.0%)	10 (20.0%)	
Non-Saudi		1 (100.0%)	0 (0.0%)	0 (0.0%)	
Age (Years)	0 (0%)				0.926
Less than 35		21 (44.7%)	16 (34.0%)	10 (21.3%)	
36 to 45		1 (100.0%)	0 (0.0%)	0 (0.0%)	
45 to 55		2 (100.0%)	0 (0.0%)	0 (0.0%)	
Above 56		1 (100.0%)	0 (0.0%)	0 (0.0%)	
Educational Qualification	0 (0%)				0.197
Resident		8 (34.8%)	10 (43.5%)	5 (21.7%)	
MBBS*		11 (52.4%)	5 (23.8%)	5 (23.8%)	
Board-certified		6 (85.7%)	1 (14.3%)	0 (0.0%)	
Department	0 (0%)				0.041
Family medicine		14 (66.7%)	6 (28.6%)	1 (4.8%)	
Internal medicine		11 (36.7%)	10 (33.3%)	9 (30.0%)	
Specialization	1 (2.0%)				0.042
General Practice		1 (25.0%)	2 (50.0%)	1 (25.0%)	
Family medicine resident		7 (63.6%)	3 (27.3%)	1 (9.1%)	
Internal medicine resident		9 (33.3%)	10 (37.0%)	8 (29.6%)	
Senior registrar		7 (100.0%)	0 (0.0%)	0 (0.0%)	
DM fellow		0 (0.0%)	1 (100.0%)	0 (0.0%)	
Year(s)of Experience	0 (0%)				0.159
≤2		13 (40.6%)	10 (31.3%)	9 (28.1%)	
>2 to 5		8 (53.3%)	6 (40.0%)	1 (6.7%)	
> 5		4 (100.0%)	0 (0.0%)	0 (0.0%)	
Authorization of GLP-1 RA prescription	0 (0%)				0.117
No		15 (40.5%)	15 (40.5%)	7 (18.9%)	
Yes		9 (69.2%)	1 (7.7%)	3 (23.1%)	
Do not know		1 (100.0%)	0 (0.0%)	0 (0.0%)	

n (%)
Fisher's exact test
* Medicine bachelor, Bachelor of Surgery

DISCUSSION

The study highlights the critical insights into the knowledge, attitudes, and practices (KAP) of healthcare providers regarding GLP-1 receptor agonists (GLP-1 RA) in diabetes management. Male and female physicians were surveyed and most of them were Saudis. Majority of participants were aged less than 35 years. Educational qualifications ranged between training residents to MBBS holders. On the departmental level, internal medicine was the predominant. Most respondents had less than or equal to 2 years of experience. GLP-1 RA prescription authorization was limited for most physicians.

Our findings demonstrated varied levels of knowledge among participants, with almost half demonstrating good understanding but a significant portion showed fair or poor comprehension. Knowledge items were scored correctly in 77.2% of participants which is close to previous studies[16,17]. Significant differences were observed based on department and specialization. Family medicine department demonstrated a good level of knowledge compared to internal medicine.

Table 4: Statistical differences between attitude levels

		Attitude level			
Characteristic	**Missing**	**Good N=10**	**Fair N=9**	**Poor N=32**	**p-value**
Gender	0 (0%)				0.019
Male		1 (4.0%)	5 (20.0%)	19 (76.0%)	
Female		9 (34.6%)	4 (15.4%)	13 (50.0%)	
Nationality	0 (0%)				>0.999
Saudi		10 (20.0%)	9 (18.0%)	31 (62.0%)	
Non-Saudi		0 (0.0%)	0 (0.0%)	1 (100.0%)	
Age (Years)	0 (0%)				0.479
Less than 35		9 (19.1%)	8 (17.0%)	30 (63.8%)	
36 to 45		0 (0.0%)	0 (0.0%)	1 (100.0%)	
45 to 55		1 (50.0%)	1 (50.0%)	0 (0.0%)	
Above 56		0 (0.0%)	0 (0.0%)	1 (100.0%)	
Educational Qualification	0 (0%)				0.141
Resident		3 (13.0%)	5 (21.7%)	15 (65.2%)	
MBBS*		3 (14.3%)	3 (14.3%)	15 (71.4%)	
Board-certified		4 (57.1%)	1 (14.3%)	2 (28.6%)	
Department	0 (0%)				>0.999
Family medicine		4 (19.0%)	4 (19.0%)	13 (61.9%)	
Internal medicine		6 (20.0%)	5 (16.7%)	19 (63.3%)	
Specialization	1 (2.0%)				0.68
General Practice		0 (0.0%)	0 (0.0%)	4 (100.0%)	
Family medicine resident		2 (18.2%)	3 (27.3%)	6 (54.5%)	
Internal medicine resident		5 (18.5%)	5 (18.5%)	17 (63.0%)	
Senior registrar		2 (28.6%)	1 (14.3%)	4 (57.1%)	
DM fellow		1 (100.0%)	0 (0.0%)	0 (0.0%)	
Year(s)of Experience	0 (0%)				0.583
≤2		5 (15.6%)	7 (21.9%)	20 (62.5%)	
>2 to 5		4 (26.7%)	1 (6.7%)	10 (66.7%)	
> 5		1 (25.0%)	1 (25.0%)	2 (50.0%)	
Authorization of GLP-1 RA prescription	0 (0%)				0.94
No		8 (21.6%)	7 (18.9%)	22 (59.5%)	
Yes		2 (15.4%)	2 (15.4%)	9 (69.2%)	
Do not know		0 (0.0%)	0 (0.0%)	1 (100.0%)	

n (%)
Fisher's exact test
*Medicine bachelor, Bachelor of Surgery

On the other hand, a study published by American College of Cardiology compared GLP-1 RA prescription pattern across specialties; endocrinologists had highest prescription rate (33%) followed by primary care physicians (29%) and lastly cardiologist (4.5%)[18]. Similarly, in a survey done by Slater et al, only 11% of cardiologists felt obligated to provide diabetes management i.e. GLP-1RA for patients following acute coronary syndrome[19]. While majority of cardiologists chose to refer to the specialist diabetes team[19]. This was attributable to lack of practical knowledge, possible side effects, patient and interdisciplinary boundaries invasion which mandate raised awareness and attitudinal change[18,19]. Likewise, significant difference in overall GLP-1RA understanding variations between physicians of various hospital levels was noticed. It demonstrated that tertiary hospitals have a higher GLP-1RA understanding than secondary and lower-level hospitals[20]. Regarding qualification, senior registrars showed the highest percentage of good knowledge followed by family medicine residents, while internal medicine residents showed the lowest percentage.

Table 5: Statistical differences between practice levels

		Practice level			
Characteristic	**Missing**	**Good N=12**	**Fair N=9**	**Poor N=30**	**p-value**
Gender	0 (0%)				0.115
Male		3 (12.0%)	4 (16.0%)	18 (72.0%)	
Female		9 (34.6%)	5 (19.2%)	12 (46.2%)	
Nationality	0 (0%)				>0.999
Saudi		12 (24.0%)	9 (18.0%)	29 (58.0%)	
Non-Saudi		0 (0.0%)	0 (0.0%)	1 (100.0%)	
Age (Years)	0 (0%)				0.473
Less than 35		11 (23.4%)	8 (17.0%)	28 (59.6%)	
36 to 45		0 (0.0%)	0 (0.0%)	1 (100.0%)	
45 to 55		1 (50.0%)	1 (50.0%)	0 (0.0%)	
Above 56		0 (0.0%)	0 (0.0%)	1 (100.0%)	
Educational Qualification	0 (0%)				0.034
Resident		3 (13.0%)	5 (21.7%)	15 (65.2%)	
MBBS*		4 (19.0%)	3 (14.3%)	14 (66.7%)	
Board-certified		5 (71.4%)	1 (14.3%)	1 (14.3%)	
Department	0 (0%)				0.158
Family medicine		8 (38.1%)	3 (14.3%)	10 (47.6%)	
Internal medicine		4 (13.3%)	6 (20.0%)	20 (66.7%)	
Specialization	1 (2.0%)				0.196
General Practice		0 (0.0%)	0 (0.0%)	4 (100.0%)	
Family medicine resident		4 (36.4%)	2 (18.2%)	5 (45.5%)	
Internal medicine resident		3 (11.1%)	6 (22.2%)	18 (66.7%)	
Senior registrar		3 (42.9%)	1 (14.3%)	3 (42.9%)	
DM fellow		1 (100.0%)	0 (0.0%)	0 (0.0%)	
Year(s)of Experience	0 (0%)				0.723
≤2		7 (21.9%)	7 (21.9%)	18 (56.3%)	
>2 to 5		4 (26.7%)	1 (6.7%)	10 (66.7%)	
> 5		1 (25.0%)	1 (25.0%)	2 (50.0%)	
Authorization of GLP-1 RA prn (%)escription	0 (0%)				0.944
No		9 (24.3%)	6 (16.2%)	22 (59.5%)	
Yes		3 (23.1%)	3 (23.1%)	7 (53.8%)	
Do not know		0 (0.0%)	0 (0.0%)	1 (100.0%)	

n (%)
Fisher's exact test
* Medicine bachelor, Bachelor of Surgery

This inter-professional difference pattern with variable qualifications was observed in many other studies[16,21,22]. Nevertheless, in United Kingdom, no significant difference was observed between general practitioners and specialist perception about diabetes injectable therapy[23]. Most of our physicians answered correctly that GLP-1 RA are the latest addition in the management of type-2 diabetes 78.4% compared to 81% in another study, however, our physician showed much better knowledge regarding the question 'GLP-1 RA carry the potential risk of thyroid C-cell neoplasm' 74.5% compared to 58%[16]. 37 % of participant did not know that GLP- RA can reduce the blood pressure which might necessitate targeted educational interventions.

Positive attitudes were generally prevalent, with a majority feeling a moral obligation to discuss GLP-1 RA benefits and risks with patients, although a substantial 62.7% of participants still exhibiting poor attitudes. This inconsistency may stem from varying levels of confidence and understanding. Poor attitude was attributed to consent form ignorance, choice of appropriate GLP-RA, mealtime while using GLP-RA and blood glucose self-monitoring encouragement (27.5%, 33.3%, 45.1% and 29.4% respectively).

Significant differences were found in attitude level of female participants which exhibited a good attitude compared to male participants, who had a larger proportion categorized under the poor attitude level 76.0%. One the other hand, Aldhobaib et al, found that male participants had better attitude 50.1%.[16]

Practice patterns showed commitment to patient safety, with many providers informing the patients about potential side effects. Similarly, this was observed in earlier study with a response about 92%[16]. On the other hand, the gaps on safety were evident in areas like recommending oral contraceptives and keeping abreast of new GLP-1 RA developments. Practice towards prescribing GLP-RA to pregnant and nursing patients are variable. Our study demonstrated that 41% of participant agreed to avoid prescribe GLP-RA, while 47% are neutral. Nevertheless, another study demonstrated that 78% of participant avoided GLP-RA prescription to pregnant and nursing patients[16]. Poor Practice was noted towards GLP-RA literature update follow up, referring to patients' history and advise about local irritation at injection site (43.1%, 19.6% and 43% respectively). Significant differences were observed in practice based on educational qualification. Board certification demonstrated a good practice compared to those with MBBS or residency qualifications. While clinical experience did not show statical significance in our study, Gourgari et al. found that lack of clinical experience is a major barrier for GLP-1RA prescription, especially higher than 5 years of clinical experience[24] Liu et al. survey exhibited a limited understanding of GLP-1RA along with low prescription patterns[20]. Low levels of deep knowledge about guidelines and consensus of diabetes management were a major reason for these results[20]. A recent review showed that GLP-1 RA had potential barriers in their prescription[25]. Which include safety concerns, patient selection, level of diabetes control, understand of treatment effects, side effects, sociodemographic, clinical and laboratory characteristics of diabetic patients managed with GLP-1 RA[25]. Therefore, filling gaps in current evidence-based recommendations is considered a priority for future efforts[25]. Strategies like empowering future research methodologies and implementation of knowledge must be applied[25]. All in all, the Chinese study supported clearly that exposure to updated guidelines, diabetes consensus statements, continuous medical education and scientific training activities significantly increased tertiary hospital physicians' knowledge and understanding about GLP-1 RA and other diabetes treatments[20].

These findings suggest that continuous professional development and systematic well-organized training programs are crucial to bridge knowledge gaps and refine practice patterns. By addressing these areas through targeted education and fostering a culture of continuous learning, healthcare providers can improve the effective and safe management of diabetes using GLP-1 RA, ultimately enhancing patient outcomes. Future research should explore barriers to effective GLP-1 RA implementation and the impact of educational initiatives on improving KAP and patient outcomes.

Limitation

Due to time inconvenience, not all the physicians of Prince Mohammed bin Abdulaziz Hospital and primary health care could complete the questionnaire successfully. Therefore, the results of the study may not fully illustrate the KAP levels of the entire members of the studied institutes.

CONCLUSION

The study showed that physicians of Prince Mohammed bin Abdulaziz Hospital and primary health care have significant knowledge, attitude but limited practice towards the glucagon-like peptide-1 class of antidiabetic medication. However, focused education and implementing vivid scientific environment for continuous learning would effectively and safely enhance the management of diabetes using GLP-1 RA, therefore, enhancing patient outcomes. In order to explore the barriers of effective GLP-1 RA implementation, further scholar and educational initiatives are highly recommended.

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Conflict of Interest

The authors declare no competing interests.

Author Contribution

AM and HB researched the literature and conceived the idea of the study. AO and HB carried out data retrieval. MT carried out analytical. RA done statistical analysis. AM, MT, and KA finally reviewed the article. All authors participated in reviewing and writing the article.

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