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A Survey of the Knowledge of Community Pharmacists Towards Diabetic Patients Counseling In Ha'il, Saudi Arabia

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Research Article

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ABSTRACT

Background: Diabetes is one of the most common chronic diseases that may contribute to severe morbidity, mortality, and disability. Community Pharmacists are essential to optimizing drug use and enhancing patient outcomes-this study aims to assess community pharmacist knowledge and services currently provided to diabetic patients.

Method: A cross-sectional study was done in the Ha'il region by a structured questionnaire including a demographic profile of the participant with the variables (gender, age, nationality, education, and experience) as well as supporting characteristics, evaluation of diabetes care services, (MCQ) Multiple Choice Questions of pharmacists' diabetes-related knowledge and perceived barriers for providing diabetic care services. The data analysis is completed by Statistical Package for the Social Sciences (SPSS) and with the endnote program for reference citation.

Results: The majority of pharmacists working in community pharmacies in the Ha'il region were Males (82.9%), Young (24years-34years) 68.5%, Non-Saudi (70.5%), about (64%-65%) of pharmacists delivered pharmaceutical care services to diabetic patients; always provide counseling for smoking cessation, drug administration, glucose monitoring, and diabetes complications. The majority of community pharmacists (61%) have

moderate diabetes-related knowledge and have various counseling barriers like limited knowledge about diabetes counseling and lack of time.

Conclusion: Ha'il region community pharmacists have a moderate understanding of diabetes counseling, so they need further training and workshops about diabetes counseling.

Keywords: Diabetes mellitus; Community pharmacist; Pharmacy; Patient; Counseling

INTRODUCTION

Diabetes Mellitus (DM) is one of the most prevalent chronic conditions and is associated with significant disability, morbidity, and mortality worldwide; similar to Saudi Arabia's condition with 23.7% estimated prevalence among the adult population which is one of the highest percentages across the world [1-2]. This Metabolic Disorder (DM) manifests in two main forms: Type 1 and type 2 diabetes [3]. It has a rapidly rising prevalence in both developed and developing countries with more than 422 million people thought to be suffering from the disease globally [4]. The International Pharmaceutical Federation and the World Health Organization have developed guidelines for community pharmacists' roles on how to provide optimal care for patients in need of medication and how to educate and monitor patients, as well as improve their medication management [5]. Community pharmacists are considered the most accessible healthcare professionals; no appointments are required to see them and have the highest level of patient contact. As such, they are well-placed to play a significant role in caring for patients with diabetes [6]. The majority of people frequently visit community pharmacies first to obtain medical assistance and health information [7]. The role of the pharmacist includes counseling and treatment and requires trust. Pharmacists can help prevent abuse and reduce the risk of patient drug therapy problems [8]. Counseling in a community setting is a complex process, which may explain the poor quality of community counseling practices [9]. The diabetic patients' attitude and their interaction and satisfaction towards the services provided by community pharmacists hold positive views for them [3]. On the other side, the pharmacists' attitudes and role in diabetes management emphasized the critical role of pharmacists' positive effect on diabetes. However, there is a limited diabetes-related service offered to patients [6]. Community pharmacists possess expertise in medicine management, are trusted by the public, are feasible, well-received, have less cost, and lead to improved health outcomes. However, the public perception and collaborations with primary care are challenging [1].

The perspectives of community pharmacists in the United Arab Emirates regarding the provision of Extended Community Pharmacy Services (ECPS) showed a positive perception of providing ECPS. They were offering such services within their available resources and facilities. The main barriers are limited time and less patient demand [7]. To improve pharmacist's counseling skills, they need educational meetings, educational materials, outreach visits, and feedback [9].

A Chinese study that looked into how community pharmacists were handling diabetes care discovered that there wasn't enough information available about how patients were being cared for at the moment, necessitating an expansion of pharmacists' areas of expertise [10].

Several systematic reviews in 2023, have reported the positive impact of pharmacist interventions on patients therapeutic, safety, and humanistic outcomes among different conditions such as hypertension and diabetes mellitus. These interventions usually involved medication review, education concerning health promotion, diseases,

medication understanding, and specific risk reduction activities. Outcomes included a significantly improved quality of life, reduced disease risk, and premature mortality [11]. Research conducted in China in 2021, has demonstrated the potential of community pharmacists in educating individuals about risk factors and the benefits of adopting healthy lifestyles. The current incidence of diabetes places a significant burden on pharmacists, necessitating a focus on diabetes care [10]. This study aims to assess community pharmacists' knowledge of diabetes, elucidate their behavior toward patients and the continuous treatment they provide, and evaluate any existing barriers. Ultimately, information from various sources will be synthesized to establish recognized, standardized procedures for assessing the quality of diabetes care.

MATERIALS AND METHODS

Aim

Our study intended to measure pharmacists' knowledge of the counseling of diabetic patients' management, identify pharmacy services currently provided to patients with diabetes mellitus in Ha'il, Saudi Arabia, and determine the barriers that hinder them from giving counsel and health promotion.

Methodology

This cross-sectional design study focused on community pharmacists based in Ha'il, Saudi Arabia, using a pre-validated self-administration questionnaire. Participants were randomly selected. This study included (145) community pharmacists living in Ha'il, City. The samples were selected by using a random sampling technique through unpredictable means in which each member of the study population has an equal chance of participation. This is to increase the validity of the results and avoid selection bias. Version 20 of the Statistical Package for Social Sciences (SPSS) was used to enter and analyze the data.

The survey is divided into four sections:

1) Demographic profile of the participant with the variables (gender, age, nationality, education, experience,) as well as supporting characteristics)
2) Evaluation of diabetes care services
3) MCQ of pharmacists' diabetes-related knowledge
4) Perceived barriers for providing diabetic care services.

Inclusion criteria: Community Pharmacists.

Exclusion criteria: Clinical pharmacists and pharmacists working in hospitals or any healthcare center.

Ethical consideration: Research ethical approval is received from the University of Ha'il, (UOH) Deanship of Scientific Research. An informed consent was obtained from all community pharmacists participating in this study.

RESULTS

Characteristics of participant pharmacist

The majority of the community pharmacists were males (82.9%), (68.5%) of them aged between (24years-34years), and (70.5%) were non-Saudis. (37%) of participants were situated in the center, (30.1%) in the north of Ha'il, (27.4%) in the south, followed by (4.8%) in the east, and minimum in the west (0.7%). The majority of pharmacists working in community pharmacies (71.9%) have graduated from a university other than Ha'il, University and only (28.1%) from Ha'il, University. (37.7%) with less than 5 years of experience and (37%) having experience between 6years-10 years. An overwhelming majority (77.4%) working one shift per day. The highest percentage (36.3%) of community pharmacists see (4-9) patients per day followed by (32.9%) who see (1-3) patients per day, and (30.1%) see more than 10 patients per day.

The highest percentage of pharmacists (74%) have (5-10) minutes as an average time spent with a diabetic patient followed by (16.4%) who do not know their time spent with those patients and only (9.4%) of pharmacists spend more than 10 minutes with their diabetic patients as shown in Table 1.

Table 1. Pharmacist information n=145.

Pattern	P.value	Frequency/percentage
Gender		.000
Male	121 (82.9%)	
Female	25 (17.1%)	
Age		.000
24-34	100 (68.5%)	
35-45	40 (27.4%)	
46-56	4 (2.7%)	
Above 57	2 (1.4%)	
Nationality		.000
Saudi	43 (29.5%)	
Non Saudi	103 (70.5%)	
Education level		.000
PharmD	77 (52.7%)	
PharmB	59 (34.2%)	
University of graduation		.000
University of Ha'il,	41 (28.1%)	
Others	105 (71.9%)	
Pharmacy region		.000
North of Ha'il	44 (30.1%)	
South of Ha'il	40 (27.4%)	
East of Ha'il	7 (4.8%)	
West of Ha'l	1 (0.7%)	
In the center of Ha'il	54 (37%)	
Years of practice in a community pharmacy		.000
Less than 5	55 (37.7%)	
06-10	54 (37%)	
11-15	27 (18.5%)	
16-20	4 (2.7%)	
More than 20	6 (4.1%)	
Shifts per day		.000
One	113 (77.4%)	
More than one	33 (22.6%)	
Average of diabetic patients seen per day		.000
Zero	1 (0.7%)	
1-3 patients	48 (32.9%)	
4-9 patients	53 (36.3%)	

More than 10 patients	44 (30.1%)	
Average duration of time usually spend with diabetic patients		.000
5-10 mins	108 (74%)	
More than 10 mins	14 (9.6%)	
Unknown	24 (16.4%)	
Receiving any diabetes training and or continuing professional education activities		0.008
Yes	89 (61%)	
No	57 (39%)	
Do you prefer to improve your knowledge about diabetes mellitus either by courses or training		.000
Yes	141 (96.6%)	
No	5 (3.4%)	
Availability of diabetic supplies and/or supplements		.000
Yes	143 (97.9%)	
No	3 (2.1%)	
Availability of anti- diabetic medications		.000
Yes	139 (95.2%)	
No	7 (4.8%)	
Note: P is significant when is≤05		

Diabetes care services

Over half of pharmacists (65.1%) consistently emphasize the value of self-checking blood glucose levels, followed by pharmacists who often provided this service (24.7%), then (8.9%) rarely had this discussion with their diabetic patients and finally (1.4%) never provided this diabetic service below as shown in Figure 1A.

More than half (65.8%) of Community Pharmacists (CPs) describe when to give each oral anti-diabetic medication, as shown in Figure 1B, (24.7%) often describe the right time, (8.2%) rarely do, and (1.4%) never describe the time.

As show below Figure 1C the findings indicate that 66.4% of CPs who instruct patients on the significance of blood pressure management in diabetes followed by (25.3%) of CPs who often raise the awareness of diabetic patients, (7.5%) of CPs who rarely provide this service, and (0.7%) CPs never do this diabetic services.

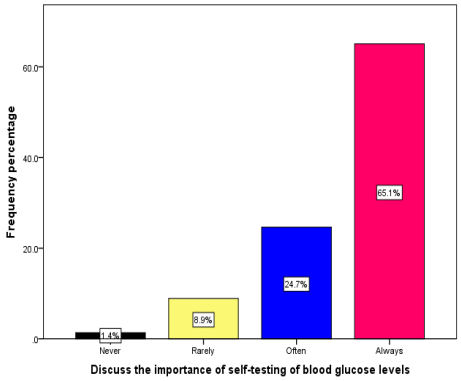
As show below Figure 1D the findings indicate that 55.5% of CPs educate patients about the value of regular medical screening for neuropathic pain, retinopathy, and nephropathy. followed by (30.1%) of CPs who often provide this service. At last, (13%) of CPs rarely provide it, and (1.4%) of CPs never provide it.

As show below Figure 1E illustrates the proportion of Community Pharmacists (CPs) who educate patients about the value of influenza and *pneumococcal pneumonia* vaccinations. The frequency percentages are almost evenly balanced with (39%) of CPs always providing education, (30.8%) often doing this, and (27.4%) rarely doing this service. Additionally, there are CPs (2.7%) who never provided education (Figure 1 (1A to 1E)).

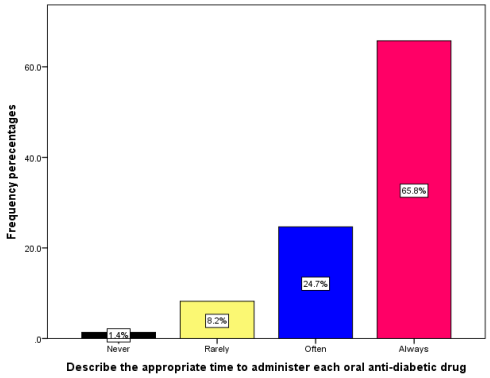
Figure 1. Frequency percentage of discussion of important issues with diabetic patient. As shown in Figure1 (1A-1E), A) Discuss the importance of self-testing blood glucose levels. B) Describe the appropriate time to administer each oral anti-diabetic drug, C) Provide education on the importance of controlling blood pressure in diabetes, D) Provide

education on the importance of regular screening for nephropathy retinopathy, neuropathic pain, E) Provide education about the importance of immunization for influenza and pneumococcal pneumonia.

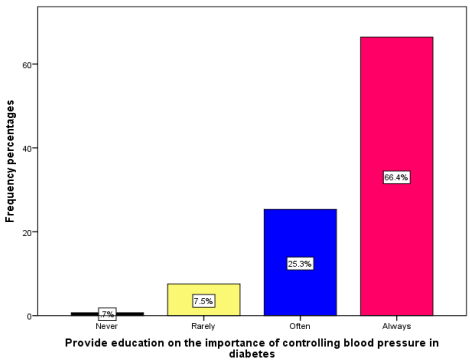
Note: (■) Always, (■) Often,(■) Rarely, (■) Never.



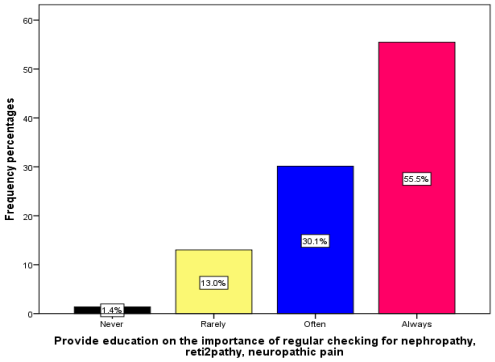
(1A)



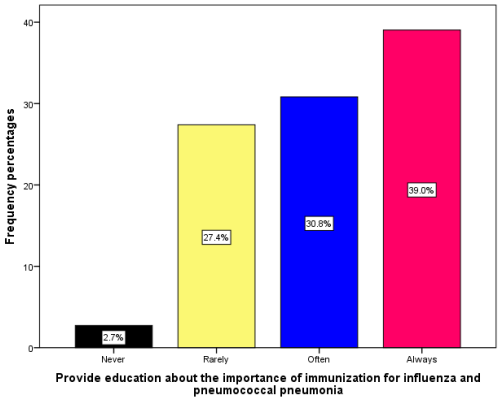
(1B)



(1C)



(1D)



(1E)

Diabetic patients counseling about (smoking cessation, hypoglycemia, contacting health care provider and foot care)

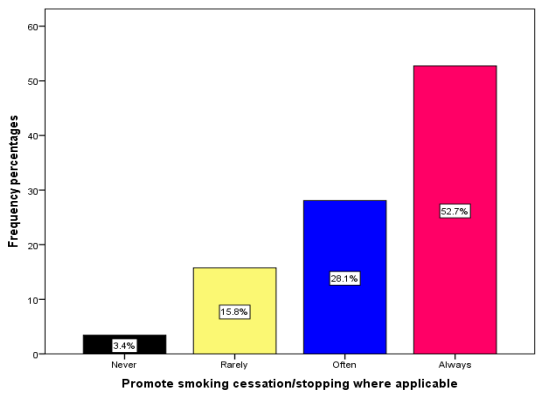
Figure 2A. describes the frequency percentages of community pharmacists promoting and encouraging patients to quit smoking where applicable. It shows (52.7%) of pharmacists always counsel smokers with diabetes to cease this habit, (28.1%) often encourage stopping, (15.8%) rarely promote quitting, and only (3.4%) never engage in smoking cessation talks with their patients.

Figure 2B. shows (54.8%) of pharmacists provide counsel on signs, symptoms, causes, and treatment of hypoglycemia to their patients, (32.9%) often do so, and (12.3%) rarely provide this service.

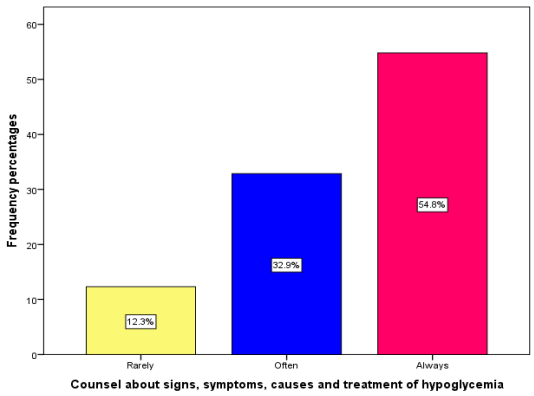
Figure 2C. shows (57.5%) of community pharmacists give counsel on when is the right time to contact a healthcare provider, (32.2%) often educate their patients on the matter, (9.6%) rarely counsel, and only (0.7%) never provide this service.

Figure 2D. demonstrates (57.5%) of pharmacists always provide counsel on good foot care techniques followed by (28.1%) of CPs who often give counsel to their communities, and (13%) who rarely educate patients on providing it, and only (1.4%) who never provided it below (Figure 2(2A to 2D)).

Figure 2. A) Promote smoking cessation/stopping where applicable, B) Counsel about signs, symptoms, causes, and treatment of hypoglycemia, C) Counsel on when to contact the healthcare provider, D) Counsel on good foot care techniques. **Note:** (▬) Always, (▬) Often,(▬) Rarely, (▬) Never.



(2A)



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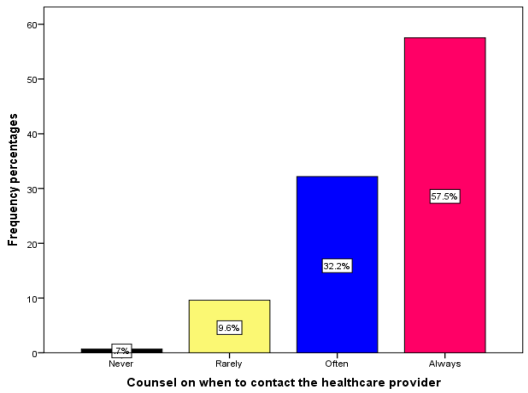
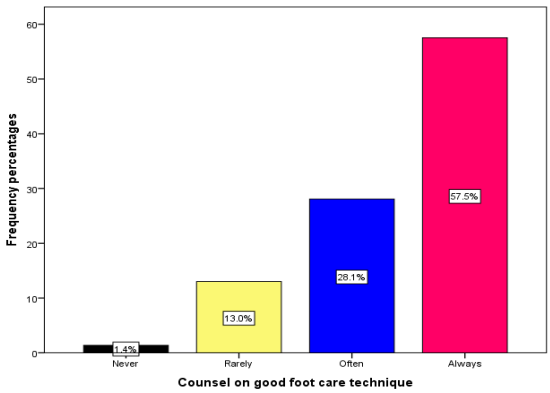


(2C)



(2D)

Diabetic patients counseling about (the importance of weight control, regular exercise, and referring a diabetic patient to a dietitian)

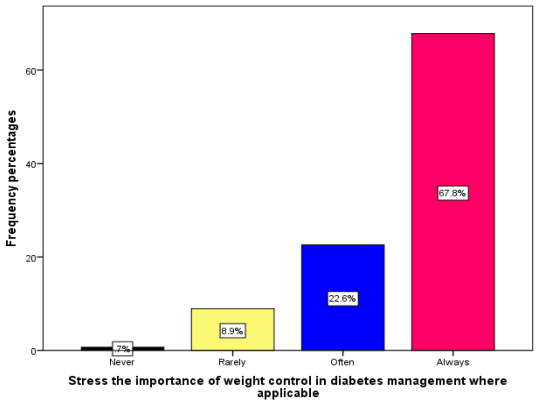
Around (67.8%) of community pharmacists stressed to their patients the importance of weight control in diabetes management where applicable, followed by (22.6%) who often provided this service, (8.9%) rarely did this service, and (0.7%) of the community pharmacists' have never provided this service in Figure 3A.

(35.6%) of community pharmacists always referred their diabetic patients to a structured diabetes education program, (40.4%) often provided this service, (21.2%) rarely provided this service, and (2.7%) never provided this service in Figure 3B.

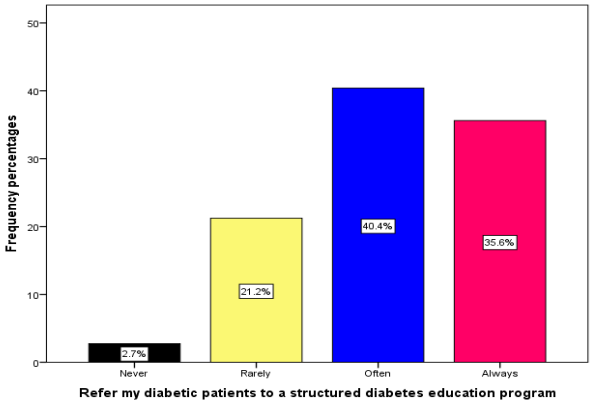
(71.2%) of community pharmacists stressed to their patients the importance of diet and regular exercise in diabetes management, around (19.2%) often provided this service, and approximately (8.9%) rarely provided this service. (0.7%) of the community pharmacists never provided this service in Figure 3C.

(38.4%) of community pharmacists referred their diabetic patients to a dietitian, around (35.6%) often provided this service, (24%) rarely provided this service, and (2.1%) never provided this service in Figure 3D.

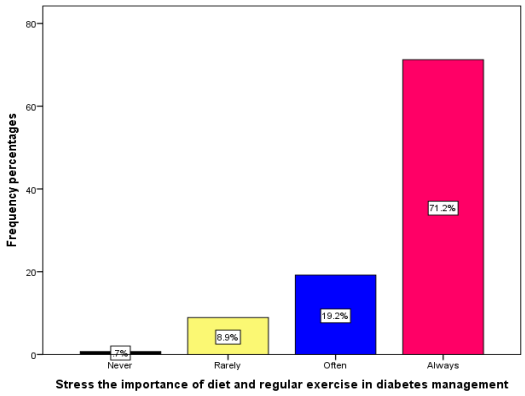
Figure 3. A) Stress the importance of weight control in diabetes management where applicable. B) Refer my diabetic patients to a structured diabetes education program. C) Stress the importance of diet and regular exercise in diabetes management. D) Refer my diabetic patients to a dietitian. **Note:** (■) Always, (■) Often,(■) Rarely, (■) Never.



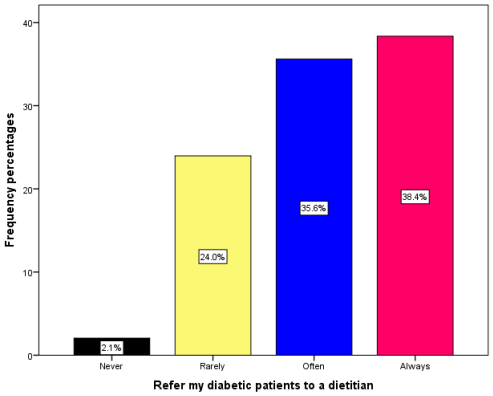
(3A)



(3B)



(3C)



(3D)

Diabetes-related knowledge

Displays the assessment of diabetes-related knowledge using ten questions. (61%) of respondents scored between (5-7) out of (10) on the test, while (30.1%) of respondents scored 7 points or higher out of 10, and only (8.9%) scored below 5 out of 10. The participant's diabetes-related knowledge average score was 7 (Figure 4).

Figure 4. Frequency percentages of pharmacists' diabetes-related knowledge n=146, **Note:** (■) 5-7, (■) less than 5,(■) 7-10.

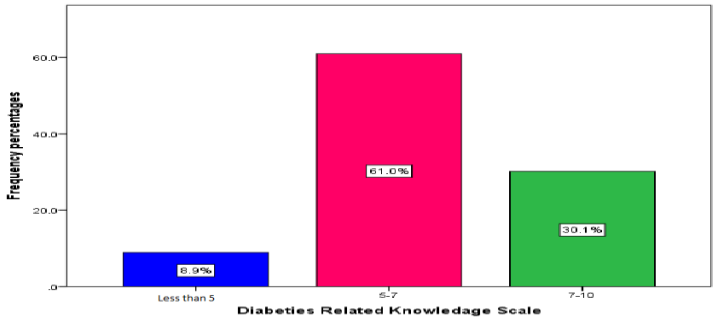
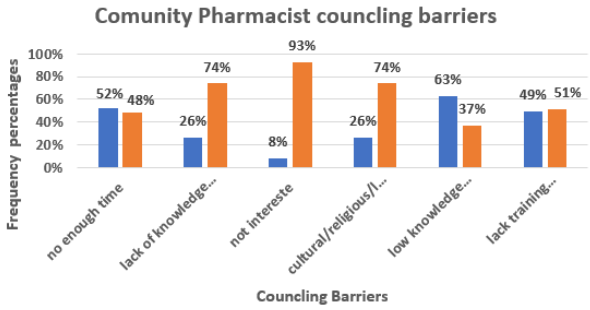


Figure 5 Displays the perceived pharmacists' counseling barriers to providing diabetic care services. Six counseling barriers have been identified and measured as shown. The results show (52%) of participants who do not have enough time to provide counsel, (74%) stated they do not lack diabetes therapeutic knowledge and skills, almost all of the participants were interested in providing diabetes care services, (74%) of participants do not have cultural, religious, or language barriers, (63%) said patients have low knowledge about diabetes management, and (49%) said there's a lack of diabetes training programs for community pharmacists (Figure 5).

Figure 5. Frequency percentage of pharmacist's counseling barrier n=146, P. value: 0.

Note: (■)-yes , (■)-no



DISCUSSION

A diabetic care service that should be provided by community pharmacists is describing the appropriate time to administer oral anti-diabetic drugs. Many patients require oral medications to control and maintain their diabetes. They engage in self-care practices which shows the need for prescribing the right time as it is important to manage the disease.

A large part (82.9%) of community pharmacists were males and a minority (17.1%) of them were females. Most of them were aged between (24-45) years. An overwhelming majority (70.5%) of community pharmacists in Ha'il were non-Saudis. A study by Almaghaslah et al., who found an unbalanced distribution of gender and saudization [12-13]. Our data included education level showing more than half (52.7%) of participants have a Pharm D degree. Also, it included years of practice in a community pharmacy showing (37.7%) of community pharmacists having less than 5 years of experience and (37%) have 6-10 years of experience, and (18.5%) have 11-15 years of experience. This demonstrates their pharmaceutical knowledge and good experience in providing diabetes care services. Brewster et al., said that Community Pharmacists are underused in diabetic care and counseling as they have the knowledge, experience, public trust, and accessibility; yet poorly integrated into healthcare models [1]. (77.4%) of community pharmacists have only one shift per day and the rest have more. (36.3%) of CPs are expected to see (4-9) diabetic

patients per day, then 32.9% see (1-3) patients, followed by (30.1%) who see more than 10 diabetic patients per day, and finally (0.7%) of community pharmacists see no diabetic patients per day. The highest percentage of pharmacists (74%) have (5-10) minutes as an average time spent with a diabetic patient followed by (16.4%) who do not know their time spent with those patients and only (9.4%) of pharmacists spend more than 10 minutes with their diabetic patients Ilardo and special highlighted that community pharmacies are informal settings where the patient can take his time and ask detailed questions which shows many advantages including time saved for both healthcare providers and diabetic patients, as well as improving health outcomes [13]. (61%) of CP were receiving diabetes training and or continuing professional education activities but only (39%) of them were not receiving training. Aloke et al., concluded with the need for proper education and a patient-centered care approach [14]. (96.6%) of CPs are willing to improve their diabetes mellitus knowledge by courses or training and only 3.4% have no interest in diabetes knowledge. Community pharmacists require diabetes updates and the latest information to provide counsel to diabetic patients in a confident manner. Douglas et al., explored the current attitudes and practices of community pharmacists in Northern Ireland showing that 74% of the study population were not confident in providing counsel to diabetic patients [15]. (97.9%) of CPs have diabetic supplies and/or supplements in their pharmacy and 95.2% have diabetic medications i.e., almost all the diabetes requirements and medication are available in most of the community pharmacies. This explores the availability of essential drugs and supplies for diabetes in Ha'il, City and shows that almost all community pharmacies are adequate. In contrast to a study conducted by Kaiser et al., in Zambia showing less than (80%) availability of anti-diabetic medicine [16].

More than half of pharmacists (65.1%) always discuss the importance of self-testing blood glucose levels, followed by pharmacists who often provided this service (24.7%), then (8.9%) rarely had this discussion with their diabetic patients and finally (1.4%) never provided this diabetic service before. Mathew et al., said that Monitoring usually occurs outside healthcare facilities due to the need for regular checking to avoid major complications or life-threatening situations from blood glucose fluctuations. This shows the dire need to raise patient's awareness and enable them to manage their diabetes [17].

More than half (65.8%) of Community Pharmacists (CPs) describe the appropriate time to administer each oral anti-diabetic drug, (24.7%) often describe the right time, (8.2%) rarely do, and (1.4%) never describe the time. Many patients require oral medications to control and maintain their diabetes. They engage in self-care practices which shows the need for prescribing the right time. A review by Saydah, regarding diabetic patients' self-practices conducted in the USA indicated that 58.4% of the surveyed population were taking their oral medications alone [18]. (66.4%) of CPs provide education on the importance of controlling blood pressure in diabetes followed by (25.3%) who often raise the awareness of diabetic patients, (7.5%) who rarely provide this service, and (0.7%) who never do this diabetic service. Brewster et al., also highlighted the improvements in community pharmacists' interventions; showing significant positive health outcomes through diabetes education in a pharmacy setting provided to patients and their families [1]. (66.4%) of CPs provide education on the importance of routine medical screening for nephropathy, retinopathy, and neuropathic pain followed by (30.1%) of CPs who often provide this service. At last, (13%) of CPs rarely provide it, and (1.4%) of CPs never provide it. A study conducted by Shin, et al., evaluating health behaviors in patients with diabetes concluded low utilization of healthcare preventive measures and recommended further effort and attention to deliver quality care for diabetic patients [19]. (39%) of CPs always provide education on the importance of immunization for influenza and pneumococcal pneumonia, (30.8%) often doing this, and (27.4%) rarely doing this service. Additionally, there are (2.7%) who have never provided education before. A survey conducted by Almusalam et al., in Riyadh, Saudi Arabia on vaccine uptake by diabetic patients concluded with low awareness of

the surveyed population recommending education interventions [20]. (52.7%) of pharmacists always counsel smokers with diabetes to stop this habit, (28.1%) often encourage stopping, (15.8%) rarely promote quitting, and (3.4%) never engage in smoking cessation talks with their patients. Campagna, et al., highlighted one constraint of people not receiving any advice about smoking with diabetes and its consequences which is the role of community pharmacists [21]. (54.8%) of pharmacists provide counsel on hypoglycemia to their patients, (32.9%) often do so, and (12.3%) rarely provide this service. Nakhleh et al., said that it is important to raise awareness of signs, symptoms, causes, and treatment hypoglycemia [22]. (57.5%) of CPs give counsel on when is the right time to contact a healthcare provider, (32.2%) often educate their patients on this matter, (9.6%) rarely counsel, and only (0.7%) never provide this service. Woodhams et al., said that it; is basic and important to know the right time to contact a healthcare provider to avoid diabetes major complications. In their peer survey, (80%) of peers identified referral service as needed and within the scope of practice [23]. (57.5%) of pharmacists always provide counsel on good foot care techniques followed by (28.1%) who often give counsel to their patients, and (13%) who rarely educate patients on foot care, and only (1.4%) who never provided it before. Wang et al., have written an article on risk factors and management of diabetic foot ulcers which are prevalent in diabetic patients leading to severe consequences such as amputation in the worst-case scenario. It requires multidisciplinary intervention, in which community pharmacists have a significant role; in pre-assessing and early monitoring of their patients avoiding extreme measures [24]. (67.8%) of community pharmacists tell patients about the importance of weight control in diabetes management, (22%) of community pharmacists often provided this service, (8.9%) of community pharmacists rarely did this service, and (0.7%) of the community pharmacists' have never provided this service. Syeda et al., said that body weight is a risk factor in diabetes that has to be controlled through physical activities highlighting certain types of exercises and elaborating on their importance; this may show the need for community pharmacists to urge diabetic patients to control their weight [25]. (35.6%) of community pharmacists always referred their diabetic patients to a structured diabetes education program, (40.4%) often provided this service, (21.2%) rarely provided this service, and (2.7%) never provided this service. A randomized controlled trial by Gehlawat et al., to evaluate the effectiveness of a culturally structured diabetes educational program for patients with diabetes showed “overall improvement in self-care behavior” However, this may depend on geographical location and availability and quality of structured diabetes education programs [26]. (71.2%) of community pharmacists stressed to their patients the importance of diet and regular exercise in diabetes management, (19.2%) often provided this service, and approximately (8.9%) rarely provided this service. (0.7%) of the community pharmacists never provided this service. A literature review by Inasu et al., has found that a comprehensive patient education starting from the pharmacist stressing the importance of diet and regular exercise in diabetes management can show significant advantages on the patient’s quality of life [27]. 38.4% of community pharmacists referred their diabetic patients to a dietitian, around (35.6%) often provided this service, 24% rarely provided this service, and (2.1%) never provided this service. Woodhams et al., also said that community pharmacists could collaborate in referring patients to dietitians to manage their conditions early on before progression to serious complications. This collaborative effort results in significant improvements in lipid profiles and health-related quality of life as supported by Inasu, at al., [27]. (61%) of respondents scored between 5-7 out of 10 on the assessment of diabetes-related knowledge, while another (30.1%) of respondents scored 7 points or higher out of 10. Also (8.9%) scored below 5 out of 10 on the test. On average, the knowledge score was 7. The American Diabetes Association (ADA) published standards of care in diabetes in 2023, and many other distinguished organizations are revising and updating the existing knowledge. This also highlights the necessity to keep community pharmacists aware and informed of recent updates through courses, training, and workshops to provide quality care

[28]. Six counseling barriers have been identified and measured. The major counseling barriers mentioned by CPs are lack of diabetes knowledge (Yes 63% to 37%No) followed by not having enough time to provide counsel (52%Yes and 48%No), lack of training to provide this service (49% yes to 51% No), cultural, religious, or language barriers (26% yes,74 No), finally lack of interest to provide this service, (8%yes &92%No) i.e. 92% of CP have the interest to provide diabetes counseling services. This supported by Teka et al., who reported that (82.3%) lack of time which could be due to a "high burden or shortage of personnel" and (71.3%) lack of access to additional training programs are the major barriers [29].

CONCLUSION

Most Ha'il, City pharmacists raise diabetic patients' awareness on the importance of self-testing blood glucose levels, prescribing the right time to administer oral anti-diabetic drugs, controlling blood pressure as part of diabetic management, following up to prevent diabetes complications, smoking cessation and provide counsel on different subjects including hypoglycemia, good foot care techniques the importance of diet and regular exercise in diabetes management. the right time to contact a healthcare provider with limited awareness about the importance of pneumococcal immunization.

Ha'il, region community pharmacists have moderate knowledge of diabetes. The major barriers hindering them from providing diabetic counseling were lack of time and training programs, as well as low patient knowledge of diabetes management.

RECOMMENDATION

Further diabetes training, workshops, and conferences must be held to improve diabetes awareness among pharmacists and provide them with access to educational material on diabetic management and counseling. As well as, stressing the need to provide diabetic patients with the appropriate time to take their oral medication through a clear written prescription with each drug. Finally, encourage them to advocate and raise the understanding of patients and healthy people about the value and importance of vaccinations.

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AUTHORS CONTRIBUTIONS

The proposal was developed with the valuable input from the author of the diabetes counseling study, came up with the title and wrote the report. Dr.Mhdia supervised the project and involved in writing of draft and final research, Hanadi Saleh, Alanoud Ayed, Saba Bader Alhejaili helped in collecting and analyzing the data. The manuscript was created by all writers. After everyone had a chance to evaluate the study, certain adjustments were made in response to his criticism. In addition, the automated clearing house bears responsibility for the work's originality and correctness.

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