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"The Role of Community Pharmacists in Diabetes Management in Hebron District"

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The Role of Community Pharmacists in Diabetes Management in Hebron District

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Declaration

I certify that this thesis submitted for the degree of Master, is the result of my own research, except where otherwise acknowledged. This study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed: .....

Firas Mohammed Al-Dweik

Date: 5th of December 2016

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Abstract

Background: Palestine is experiencing a rapid health transition, with a large and rising burden of chronic diseases. Diabetes is considered to be one of the ten leading causes of death in Palestine. In Hebron district there are wide net of community pharmacies that play a potential role in serving the diabetes patients .

Objective: The main objectives of this research are to determine the needs required by the community pharmacists to enhance their practice in diabetes care, also to determine the nature of the common practices served by pharmacists for the diabetic patients and the frequencies of common activities related to diabetes , in addition to determine the main obstacles that impede pharmacists from playing the role in managing diabetic patients.

Methodology: This is a cross sectional descriptive study on community pharmacists in Hebron district, the tool of research was customized questionnaire adopted from a credible Canadian research tool.

Results: Pharmacists in Hebron district showed a good knowledge about diabetes, its complication , and management. Pharmacists 'often' advised their patients to follow better diets, continually monitor blood glucose level, guiding the patient about the importance of foot care, informing them about the time to take medications, providing basic information about the importance of sports in monitoring their glucose level, guiding patients on the appropriate way to use insulin injections. In their pharmacies, pharmacists also routinely check diabetic patients medication and insure to be used appropriately and also identify a possible drug –drug interaction mostly with the over the counter medications.

Time constrains and the lack of patient response to the advice were the major obstacles reported by community pharmacists that impede them from giving the services

Conclusion: Community pharmacists in Hebron district are experiencing a positive attitude and willing to help patients suffering from diabetes, there is an importance of engagement of the community pharmacists in any future plan on the national level regarding any diabetes education programs ,also there is a need to improve the community pharmacists' role in healthcare system by providing continuous education for them .

دور الصيادلة في محافظة الخليل في علاج مرضى السكري

إعداد: الطالب فراس محمد عرفات الدويك

إشراف: الدكتور محمد شاهين

الملخص:

خلفية البحث: يعاني المجتمع الفلسطيني من كاهل وعبئ الأمراض المزمنة وخاصة مرض السكري والذي يعد من أحد الأسباب الرئيسية للوفاة في فلسطين. تلعب الصيدليات المجتمعية في محافظة الخليل دوراً مهماً في مساعدة وعلاج مرضى السكري.

الهدف: من الأهداف الرئيسية لهذا البحث هي تحديد نوع وطبيعة الخدمات التي يقدمها الصيدلي لمرضى السكري بالإضافة إلى تحديد المعيقات التي قد تحد أو تمنع من تقديم هذه الخدمات.

المنهجية: أجريت دراسة مسحية على مستوى محافظة الخليل على مجتمع من الصيادلة وقد تم استخدام استبيان معتمد.

النتائج: أظهرت النتائج أن الصيادلة لديهم دراية وعلم بمخاطر مرض السكري ومضاعفاته يقوم الصيادلة غالبا بتقديم الإرشاد والنصح لهؤلاء المرضى المتعلقة بمراقبة مستوى السكر بالدم وتلك المتعلقة بالحمية الغذائية واتباع أسلوب حياة صحي. أيضا يقوم الصيادلة غالباً بإعطاء الإرشادات المتعلقة بحقن الأنسولين وكيفية استعمالها، وأيضاً بالنسبة للأدوية التي تعالج هذا المرض وكيفية المواظبة والالتزام بتناولها في أوقاتها. كما أظهرت النتائج أن ضيق الوقت وعدم استجابة المرضى للنصائح هي في الغالب من أهم الأسباب أو المعيقات لعدم تقديم هذه الخدمة بشكل جيد.

الخلاصة: يقوم الصيادلة بشكل عام بتقديم معظم الخدمات المتعلقة بمرض السكري بنسب متفاوتة، يوجد فرصة جيدة لاستغلال القطاع الصيدلاني في أي برنامج مستقبلي يعنى بعلاج مرضى السكري على مستوى الوطن.

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Acronyms

DM: Diabetes Mellitus

HbA1c: Glycated Hemoglobin

WHO: World Health Organization

DBP: Diastolic Blood Pressure

SBP: Systolic Blood pressure

FBG: Fasting Blood Glucose

PPA: Palestinian Pharmacists Association

MOH: Ministry of Health

ADA: American Diabetic Association

Chapter One

Subject of Thesis

1.1 Background

Palestine is experiencing a rapid health transition, with a large and rising burden of chronic diseases, which are estimated to account for a large proportion of all deaths. Diabetes is considered to be one of the 10 leading causes of death in Palestine(Afshin et al., 2015).

The dramatic increase in the number of new diabetes cases in recent years and the expected increases in coming years will place a strain on all health care professionals(Basile, 2000).

Thus new and innovative methods and approaches to decrease the burden of the disease are needed.

The concept of "total-patient care" and the approach of "multidisciplinary team work" are central principles in modern diabetes care(Martinez-Gomez, Moreno-Carrillo, Campillo-Soto, Carrillo-Garcia, & Aguayo-Albasini, 2014).

Patients' empowerment and self-management mediated by education and motivation are one of the new important methods in this regards(Canadian Diabetes Association Clinical Practice Guidelines Expert et al., 2013) as they showed high level of success in controlling blood glucose level in diabetic patients.

So in order that the aforementioned methods to be achieved; it would be more effective if support is delivered via readily accessible facilities such as community pharmacies.

According to the Palestinian Pharmacists Association (PPA) publishes; there are 1016 currently working community pharmacies in the west bank. However there were some studies that addressed the vital role of community pharmacists in Palestine(Al-Ramahi, 2013; Zaid, Al-Ramahi, Shahed, Saleh, & Elaraj, 2012) .

According to local cross sectional research study by Khodour et al in 2012, which aimed to determine the perception of Palestinian consumers of the community pharmacists and the services they offer, they found that the Palestinian consumers have a positive perception about community pharmacists and about their services,the researchers recommended to increase the awareness among the public about the role of community pharmacists(Khdour & Hallak, 2012).

Pharmacists are the most accessible healthcare professionals to many chronically ill patients. It has been demonstrated that they see patients with diabetes up to five times more often than any other healthcare providers(Schapansky & Johnson, 2000). Additionally, pharmacists enjoy more free time than other medical practitioners and are usually accessible with no need for pre arrangements or to set an appointment.

1.2 Research problem and significance

The proposed research study aims to understand the exact role practices and activities concerning diabetes care management by Palestinian community pharmacists in Hebron district, located in the southern part of the West Bank. In Hebron, there is a wide network of community pharmacies which could potentially undertake a valuable supporting role in diabetes care, through direct interactive connection with the diabetics.

Keeping in mind; that any future intervention that involves pharmacists; will definitely require deep understanding and to know the nature of activities and services provided by those pharmacists for their diabetic patients.

Additionally, conducting such a research would help to define pharmacist roles as part of the professional team that can positively help in complementing the roles of others such as doctors, nurses, community health workers, lab technicians, dietitians, and others.

This study, will focus on exploring the practices and activities of community pharmacists in supporting diabetic patients, in managing their diabetes in Hebron district.

1.3 Objectives

The main objectives for this research is to

A. To determine the needs required by the community pharmacists to enhance their practice in diabetes care.
B. To determine the frequencies of common activities and services served by the community pharmacists for the Diabetic patients.
C. To determine the nature of the common practices served by pharmacists for the diabetic patients.
D. To assess if there is a statistical relationship between the mentioned practices and the identified variables in the designed questionnaire.
E. To determine the main obstacles that impede pharmacists from playing the role in managing diabetic patients

1.4 Research Questions

The research questions this study is aiming to address are:

1: What are the current practices of community pharmacists towards diabetes and diabetic patients in terms of:

1. Causes and consequences
2. The recently diagnosed new cases of diabetes.
3. Early detection of new cases.
4. Prescription and use of drugs(availability of antidiabetic medicines including insulin)
5. Home care.
6. Monitoring of patient condition.
7. Foot care.
8. Dealing with complications.
9. Using alternative medicine.
10. Referral of cases.
11. Others(any promotional material given from the community pharmacists to the diabetic patients).

2: What is the status of services for diabetic patients served by community pharmacists in Hebron district.

3. Is there a relationship between these practices and the followings?

- Age
- Gender
- Years of experience
- Professional qualifications
- Previous training in diabetes management
- Employer vs. employee at the pharmacy
- Size of staff
- Urban vs rural community pharmacists

4. What are the main obstacles that impede pharmacists from playing the role in managing diabetic management?

1.5 Research hypothesis

The hypotheses cover all potential independent variables. These variables included in Table(1) are derived from the literature and from the conceptual framework of the study in addition to the personal experience of the researcher.

This study adopts the following hypothesis:

1. There is an association (no statistically significant relationship) between the variable of pharmacist's age and his/her role in the management of patients with diabetes.
2. There is no association (statistically significant relationship) between the role of the pharmacist in the treatment of patients with diabetes and his/her work in another pharmacy.
3. There is no association (statistically significant differences at the level of significance of (0.05) from the pharmacists point of view, regardingtheir role in the management of patients with diabetes are due to each of the following variables (gender, pharmacy site, relationship of pharmacist to the pharmacy, previously taking courses or training, attend conferences, read private medical journals, being a member in a foundation specialized in the treatment of patients with diabetes)
4. There is no significant differences at the level of significance (0.05) from the point of view of pharmacists about their role in the treatment of patients with diabetes are due to

each of the following variables (number of employees in the pharmacy, years of experience, age groups pharmacist).

5. There is no statistically variation at the level of significance (0.05) from of pharmacists' point of view, regarding their role toward diabetic patient care toward the following variables (age, number of workers in the pharmacy, years of experience).

1.6 Definitions

- **Community pharmacists** are the health professionals most accessible to the public. They supply medicines in accordance with a prescription or, when legally permitted, sell them without a prescription.(WHO)
- **Diabetic retinopathy** is a diabetes complication that affects eyes. It's caused by damage to the blood vessels of the light-sensitive tissue at the back of the eye (retina).
- **Hypertension**, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure.(WHO)
- **Diabetic neuropathy**: Peripheral nerve damage from diabetes.(ADA)

Chapter Two

Literature review

2.1 Introduction

There is a large volume of published literature on the evolving role of the community pharmacist in chronic disease management such as diabetes (Dhippayom & Krass, 2015) and hypertension (Tisdale, 2006). Many studies have demonstrated the effect of pharmacist intervention on the level HbA1c (Glycated Hemoglobin: form of hemoglobin that is measured to identify a three-months average plasma glucose level) in diabetic patients (Butt, Mhd Ali, Bakry, & Mustafa, 2016; Jahangard-Rafsanjani et al., 2015; Ko et al., 2016; Pinto, Kumar, Partha, & Bechtol, 2014). There is an overall agreement that pharmacist intervention is a successful mean in reducing HbA1c levels in patients with type 2 Diabetes Mellitus (Al Hamarneh, Charrois, Lewanczuk, & Tsuyuki, 2013). The range of reduction in HbA1c is 0.5% - 3.4%. Accordingly, pharmacist intervention proved to be successful in improving patients glucose level in type 2 Diabetes Mellitus and subsequently a reduction in diabetes complications (O'Donovan, Sahm, Shannon, & Byrne, 2011) .

2.2 Diabetes and its complication

According to the World Health Organization diabetes is defined as a chronic disease that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin produced. Hyperglycemia, increased blood sugar, is a common effect of an uncontrolled diabetes and with the time leads to serious damage to many of the body's systems, especially the nerves and vascular systems (Kumar, Nandhini, Kamalanathan, Sahoo, & Vivekanadan, 2016; Marchesini et al., 2004).

In general, diabetes vascular complications are divided into two groups,microvascular which comes due to damage to small blood vessels and macrovascular which is due to damage to larger blood vessels. While microvascular complications include damage to eyes (retinopathy) which may lead to blindness, to kidneys (nephropathy) leading to renal failure and to nerves (neuropathy) leading to impotence and diabetic foot disorders,the macrovascular complications include cardiovascular diseases such as heart attacks, strokes and insufficiency in blood flow to leg(Chauhan & Sharma, 2016). In addition, neurological dysfunction may occur in most organ systems and can by manifest by constipation, diarrhea, bladder dysfunction, erectile dysfunction, exercise intolerance, resting tachycardia, silent ischemia, and even sudden cardiac death.(Maser, Mitchell, Vinik, & Freeman, 2003)

2.3 Diabetes in Palestine

In the Palestinian community, lifestyle changes, rapid urbanization and socioeconomic development, stress, smoking, and changes in food habits has increased the risk of non-communicable diseases especially diabetes mellitus.(Rashed, Sabbah, Younis, Kisa, & Parkash, 2016).According to the International Diabetes Federation there are almost 150,000 cases of diabetes reported in Palestine during 2015 with an estimated 12% prevalence among the Palestinian population(Abdul-Rahim et al., 2001). In addition, diabetes is considered to be one of major health problems among Palestinian refugees.(Shahin, Kapur, & Seita, 2015).The increase in the prevalence of diabetes in Palestine currently poses a large challenge to the Palestinian health care system(Abu-Rmeileh, Husseini, Capewell, O'Flaherty, & project, 2013).

2.4 Role of community pharmacists in diabetes management

2.4.1 Pharmaceutical Practice toward Diabetes:

Pharmaceutical care is defined as the pharmacist's contribution to the care of individuals in order to optimize medicines used in order to improve health outcomes. (Allemann et al., 2014). Optimizing drug use includes prevention or reduction of inappropriate drug usage and promoting patient's self medication and literacy to achieve greater equality in healthcare, and the balanced sharing of responsibilities(Chung, Chua, Lai, & Chan, 2014).

Pharmacist as part of their role as health care provider should be trained to identify the initial signs of diabetes and to refer the patients for appropriate medical examination. Pharmacists are also involved in detecting drug-related side effects and subsequently minimizing potential risks associated with improper use of medications(Monaghan & Monaghan, 1998). Moreover, pharmacist roles include achieving maximal patient drug adherence in order to improve patients quality of life (Monaghan & Monaghan, 1998; Vlcek, Maly, & Dosedel, 2009).
A significant drop in HbA1c levels occurred, which showed that the involvement of a pharmacist in a health care team could improve patient results.(Brooks, Rihani, & Derus, 2007)

Mehuys and colleagues have assessed the effectiveness of community pharmacist interventions in diabetic care in Belgium (Mehuys et al., 2011).The interventions mainly focused on correct use of medication, medication adherence, healthy lifestyle promotion, and changes in pharmacotherapy in 135 diabetic patients. Their results showed a significant reduction in HbA1c

levels(1.05%) in those patients whose pharmacotherapy plans were changed by a pharmacist's intervention(Mehuys et al., 2011).

In another study by Lim & Lim (2010), pharmacist role in managing diabetes was shown to be effective. A 43 diabetic patients whoseHbA1c level is >8% and completed eight visits were involved in the previous retrospective study at Penang Hospital in Malaysia. The level of HbA1c and glucose have been monitored during each visit. After completing the eight visits HbA1c FBG levels have been significantly reduced by 1.73% and 2.65mmol, respectively(Lim & Lim, 2010). This reduction in Hb1Ac and FBG levels was associated with patient adherence to medication regimens.

In another study by(Brooks et al., 2007) , which intended to evaluate the clinical pharmacist's role in a multidisciplinary health care team; included physicians, clinical pharmacists, registered nurses, and a registered dietician. Diabetic patients at multispecialty ambulatory care medical group in suburban Chicago were seen by clinical pharmacists for interventions; education, initiation, or adjustment of pharmacotherapy plans; and ordering of pertinent laboratory tests.

Also; in another 53 week study, conducted in Massachusetts USA in 2007, to evaluate the outcomes of implementation of a pharmacist supervised at Veterans Affairs diabetic clinic.
A total of 160 diabetic patients, who were taking either an oral hypoglycemic medication or insulin, were included in the study.
The patients met with pharmacist after 12 weeks for review of clinical outcomes.
A mean reduction of more than 1% (9.12% ± 1.41% to 7.94% ± 1.18%) in the HbA1c value was observed.

Further HbA1c improvements were documented in patients followed for 6 months after clinical enrollment.

This study revealed that a pharmacist's intervention can have a positive impact on patient's therapy outcomes.(Collier & Baker, 2014) .

In a 6 month randomized(Mehuys et al., 2011), controlled, parallel-group trial with 135 diabetic patients was conducted in Belgium to assess the effectiveness of community pharmacist interventions in diabetic care.

Patients at 66 community pharmacies were randomly assigned to receive a pharmacist's care.

The interventions mainly focused on correct use of medication, medication adherence, healthy lifestyle promotion, and changes in pharmacotherapy (ie, type and/or dose of hypoglycemic agents).

The results showed a significant reduction (1.05%) in HbA1c in those patients whose pharmacotherapy plans were changed by a pharmacist's intervention(Mehuys et al., 2011)

2.4.2 Effects of community pharmacist intervention on Patient's Knowledge

The lack of knowledge about the DM ,its management and complications can be considered an important reason for improper control of DM.

Education on self-management is the cornerstone of care for all patients with diabetes and is necessary for the improvement of Patient's medical status.

It is defined as an ongoing process of facilitating the knowledge, skill, and ability necessary for diabetes self-care(Funnell et al., 2007).

In a twelve months , non-crossover, single group trial(Berringer et al., 1999)on a group of 82 diabetic patients at 2 independent community pharmacies in Richmond, Virgina. Patients received diabetic medication counseling, printed educational material, and instructions on dietary regulation, exercise, and lifestyle modifications from the community pharmacist. Average morning blood glucose levels decreased by 19.3 mg/dL at the end of 6 months ($P = .07$) and 29.3 mg/dL at the end of 12 months ($P < .05$).

The frequency of symptomatic episodes of hyperglycemia and hypoglycemia was significantly reduced in the intervention group.

The data analysis indicated that pharmacist's intervention has a positive impact on the diabetic patients which were resembled by very good glycemic control, good health, and a good understanding of disease and its management at the end of study(Berringer et al., 1999).

2.4.3 Effect on Diabetes-related Complications

Diabetes complications could be disabling or even life threatening. These complications could be damage, dysfunction, and failure of various organs, specifically the eyes, kidneys, nerves, heart, and blood vessels.

One retrospective study(Kiel & McCord, 2005) with 157 diabetic patients was conducted to evaluate changes in clinical outcomes for patients enrolled in a pharmacist coordinated diabetes management program, the study was conducted between June 2003 and April 2004.

The program was housed in a multispecialty physician group practice within a managed care environment.

Twenty two physicians held practice agreements with two clinical pharmacy specialists. Data collection included baseline (within 6 mo of enrollment) and follow-up values for HbA1cand lipids as well as frequency of annual foot, eye examinations and also micro albumin screening.

Significant improvements were observed in HbA1c and LDL values.

The frequency of micro albumin screening increased by 27% ($P < .001$), and the number of patients with annual eye and foot examinations increased by 27% ($P < .05$) and 15% ($P < .05$), respectively.(Kiel & McCord, 2005)

Another nonrandomized, prospective study(Cioffi, Caron, Kalus, Hill, & Buckley, 2004) spanning 9 to 12 months was conducted in 70 Veterans affairs patients to determine the effect of a clinical pharmacist who directed diabetes management clinic on glycemic control, as well as cardiovascular and renal parameters, in patients with type 2 diabetes.

Patients met with pharmacist every 6 to 8 weeks for approximately 30 minutes for education, medication counseling, monitoring, and management.

The HbA1c level significantly decreased ($P < .001$) during the 9 to 12-month evaluation period.

2.4.4Effects on foot care and retinal examination

The Diabetic foot is considered as one of the most serious and dangerous complication that may resulting from this disease. One study (Nowak, Singh, Clarke, Campbell, & Jaber, 2002)reported an increase in the number of patients having regular foot examinations. The study was conducted at an ambulatory, multispecialty physician group practice within a managed care environment in

suburban Chicago in the USA. A total of 316 patients with DM were referred to a clinical pharmacy service for interventions.

Drug therapy management and education services were provided by a clinical pharmacist. A total of 316 patients were referred to the clinical pharmacist from October 2001 to June 2002.

Frequency of annual dilated retinal examinations and monofilament foot examinations increased by 29% ($P < .05$) and 12.5% ($P < .05$), respectively(Nowak et al., 2002) .

2.5Asheville Project

The Asheville Project is considered to be one of the most important projects that highlight the importance of the role of community pharmacists in diabetic management(Cranor, Bunting, & Christensen, 2003).It is a progressive pilot project, which was launched in 1997 by the city of Asheville-North Carolina, provided education and personal over site for city employees with chronic health problems, such as diabetes. Through the project duration; trained pharmacists hold face to face meetings with employees with diabetes to educate, motivate, and empower the employees to better manage their condition with resultant improved health status and reduced diabetes associated costs.

The essential elements of the Asheville model included; a network of specially trained community pharmacists to whom employees with diabetes made regular visits for care monitoring and counseling, employer payment to pharmacists for pharmaceutical care services.

Pharmacists have performed a variety of patient specific tailored services that included:

a)Setting and monitoring diabetes treatment goals.

b) Adherence strategies,

c) Performed physical assessment of patient's feet, skin, blood pressure, and weight.

d) Referring patients to their physician or diabetes education center as needed.

e) Home glucose meter training,

f) Diabetes and lipid management education.

2.6The clinical and financial outcomes for the Asheville project

First the mean HbA1c values and lipid levels of program participants has been decreased, with more than 50% of participants demonstrating improvements at every measurement,

Second; at the first six month follow up, 24.3% more patients had optimal A1c values (<7.0%) compared to baseline values (increases of 27.2% and 18.2% more patients were noted at the second and third six month follow ups, respectively).

Third; there was a decrease in the emergency department visits at a rate that is one to third the national average,

Fourth; the employer program sponsors has realized decreases in total direct medical costs.

Finally employer return on investment was four to one for diabetes patients.(Cranor et al., 2003)

2.7 Conclusion of literature review

The aforementioned reviews indicate that;a pharmacist intervention offers a potential benefit to reduce levels of HbA1c. In addition; it improves medication adherence in diabetes, and it lowers the diabetes related complications significantly. The review also; finds evidence that metabolic control of diabetes can be affected by a patient's knowledge of the disease.

A community pharmacist, can improve to a distinguished level, not only adherence but also patients satisfaction and quality of life. The review also emphasizes that medication management or intervention programs of the aforementioned studies by pharmacists provide improvements in clinical, humanistic, and financial outcomes for patients with a chronic disease. Finally Pharmacist integration into a health care team has proved to be effective in improving a number of clinical health outcomes.

However; it was hard to find similar researches to the subject of this thesis, due to the few conducted related studies, which resulted in limiting the overall conclusion.

Chapter Three

Theoretical framework

The available literature on pharmacist role in diabetes management has thus far focused on individual factors related to the education, training, and experience of the pharmacist with less focus on the societal factors that influence the role of the pharmacist (e.g. the location of the pharmacy in an urban or rural area). This research combines both individual factors and societal factors.

Adopting the pharmacist-led chronic disease management model Figure(A), we can see that the research addressed pretty much the same pillars. The model identified 70 papers (published from 1995 to 2015), representing 62 studies of 64 unique study populations(Greer et al., 2016).

The model address the chronic disease studies, including cardiovascular disease, diabetes, depression, and hypertension) enrolling 34457 patients.

This model has been selected in order to help achieving research objective and also to organize the ideas.

An evidence of moderate-strength indicates that pharmacist-led chronic disease management increases goal attainment for HbA1c, blood pressure, and cholesterol levels.

Moderate- or low-strength evidence also indicates that pharmacist-led chronic disease management and usual care were similar for urgent care visits or hospitalizations, clinical events, and adherence to medications. Evidence was insufficient for patient satisfaction

Components of Pharmacist-Led Chronic Disease Management
By (Greer et al., 2016)

a. Medication Monitoring: follow-up after prescription for medication effectiveness and safety, drug-related problems
b. Medication Therapy Review: includes medication reconciliation
c. Immunizations: pharmacist provides immunization; immunization was not an outcome of interest
d. Disease Self-care and Support: facilitate access to other health care professionals; education about disease, lifestyle changes; aspirin therapy; tobacco cessation

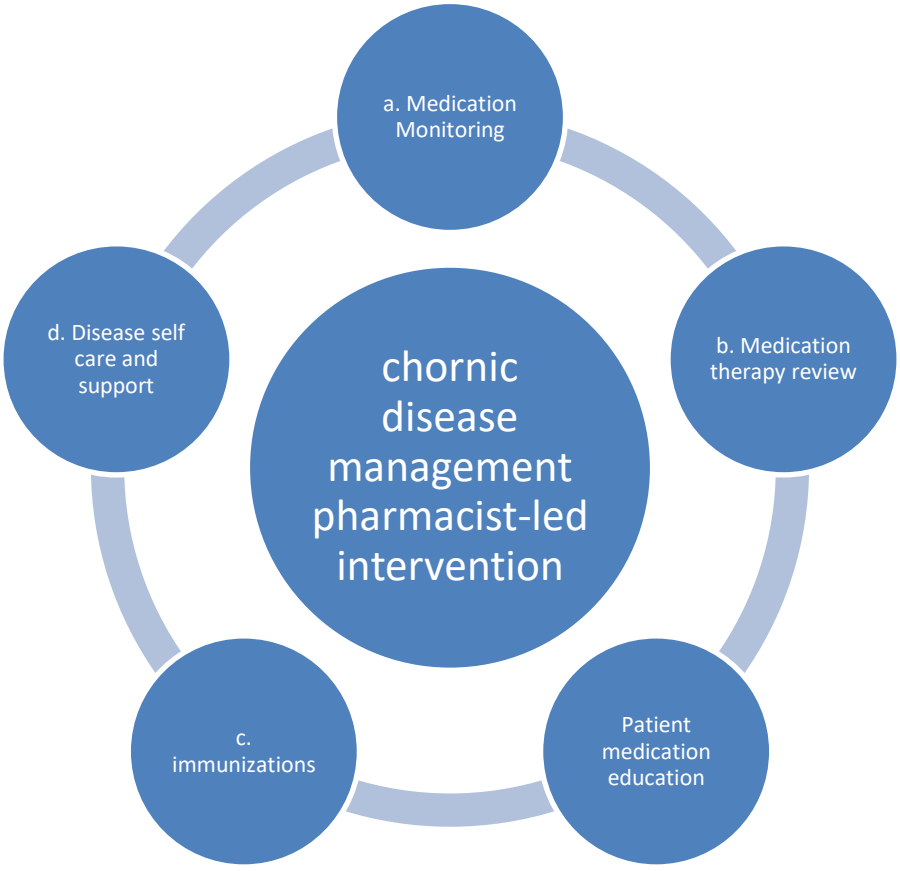

Figure A: Chronic disease management

Chapter Four

Research Methodology

4.1 Research design

This is a cross sectional study, designed to measure the current practices of community pharmacists in Hebron district toward diabetes management.

4.2 Description of the location of research

Hebron District is the largest district in the West Bank with around 650000 inhabitants, according to the Palestinian Central bureau of Statistics (PCBS) last updated in 2011.

The District constitutes around 16% of the total area of the west bank. The research questionnaire was filled with a representative sample of pharmacists, who are working in the community pharmacies of Hebron district.

An updated list of the names and location of the community pharmacies has been obtained from the Pharmacists Association which indicated the presence of nearly 203 community pharmacies in Hebron District (villages and city)

There are 203 community pharmacies in Hebron District: 130 in rural areas and 73 in urban areas. An average 1-2 pharmacists and aid pharmacists work in each pharmacy.

4.3 Sampling and selection method

A sample size of 130 out of 203 pharmacists was identified. Nevertheless; only a 100 questionnaire were filled by 100 pharmacists, representing 49.2% of the community pharmacists in Hebron district. A sample has been chosen out of the list of community pharmacies obtained from the pharmacists association which indicated the presence of nearly 203 community pharmacies in Hebron District (villages and city) based on this list a sample has been chosen

4.4 Research tools

The research's main tool is a questionnaire that has been adopted from a credible Canadian research tool (Survey of Pharmacist Activities and Attitudes in Diabetes Management) by Scot H. Simpson, BSP, PharmD, MSc(Simpson et al., 2009) .

The questionnaire has been customized in order to make it suitable for the local Palestinian community pharmacist. Some questions that are not compatible with the Palestinian context were removed in order to adapt to the local Palestinian pharmaceutical status(i.e alcohol consumption)

The customization process has been done in cooperation with some experienced community pharmacists who has a good knowledge and practice in this field. The process came up eventually with the identification of the ten main variables. See Annex 2, Table (1).

4.5 Questionnaire description

The questionnaire is divided into three sections

The first section is concerned with demographic variables related to the working community pharmacists in Hebron district.The second section is concerned with pharmacy practice related to diabetic patients, while the third section is mainly asking about the activities and services which are served by community pharmacists to diabetic patients these are 51questions which were divided into 8 major fields which measure the following:

The first field is related to the early detection of new cases of diabetes, the second measures if the pharmacists are doing blood sugar detecting test for their patients, the third measures the interventions for treating hypoglycemic patients, the forth measures the medication treatment in general, the fifth is concerned with the insulin treatment and the sixth is medication taken orally, the seventh is concerned with treatment of the accompanying diabetic chronic diseases(Hypertension), and the eighth field is concerned with health life style for the diabetic patients.

The scale of answers is leveled from" I do not offer" to "always"

4.6 Coding of answers:

The answers to third paragraph were given the following weights:

"I do not offer" (1) degree

The answer "rare" (2) degrees

The answer "often" (3) degree

The answer "always" (4) degrees

The calculation of the correction key of the questionnaire has been done as following:

Constitute the degree of availability of services expressed by paragraph **always** from the standpoint of respondents if the average ranged arithmetic paragraph is of value between 3.28-4, and is considered **often** if the average ranged arithmetic paragraph is of value between 2.52-3.27, and is to be considered as **rare**ly if average ranged arithmetic is of value 1.76-2.51.

The option "**do not offer** "is considered if the arithmetic average ranged paragraph is of value between 1-1.75.

4.7 Data and statistical analysis

After data collection; this study has been reviewed in preparation for the analysis purpose.The analysis was conducted using statistical analysis software, through giving specific figures for the responses, considering converting the verbal responses into digitalized values to facilitate the analysis.

The Processing of statistical data extracted frequencies, percentages, averages and standard deviations. The T test per set and this has been done by using the statistical software packages Statistical Package for Social Science (SPSS).

4.8 Sample Description

The sample constitutes of 100 community pharmacists respondents, with a demographical distribution of 57% from villages and 43% from Hebron city. On the other hand; the gender distribution of the sample was 75% males, and 24% females with a missing reply of one 1% .

Age groups where distributed in three age categories; category one is between 23 -30, category two is between 31 -40, and category three is above 41 years old.

When talking about the university degree the B.A holders were the majority of respondents with 89% percentage while the master degree holders were 7% and the PhD holders were 2%.

Regarding years of experience:

18 percent of the respondents regarding years of experience (YOE) had an experience between 1 to five years while 23 percent had 6 to years of experience, 26 percent had an experience between 11-15 years while 8 percent had an experience more than 15 years.

Regarding the Ownership 64 percent were owner of the community pharmacies while 30 percent worked as employee.

4.9 Piloting

The study tool was applied on a prospective sample, consisted of thirty pharmacists of the study population, and it has been observed that the questionnaire was clear and the respondents did not have any notes or complains about it.

Stability of the tool has been measured through the implementation of two main methods, that are: 1) internal consistency measurements (Cronbach's alpha)to the questionnaire dimensions, which consists of "51"paragraphs.2) the split half method.

The following table (i), shows the Cronbach's Alpha and the split half coefficient for the questionnaire

N of Items	Answers .n	Cronbach's Alpha	Split-Half Coefficient
55	30	.965	905.

Table (i): cronbach's Alpha and the split half coefficient

The above table; shows that tool Cronbach Alfa has a high positive value at the time the split half coefficient has also a positive and high value ,this enables the questionnaire to be used for the research purposes which has been built for .

Chapter Five

Research Results

5.1 Introduction

This chapter includes a comprehensive description, for the obtained results that meant to answer the research questions and research objectives, also to test the validity of its hypothesis by using the previously mentioned tests (in chapter four), which also will be furthered discussed

5.2 Research Questions and Answers

All referral tables of analysis are listed in Annex 2.

Q1: What are the current practices of community pharmacists towards diabetes and diabetic patients in terms of:

1. Causes and consequences
2. The recently diagnosed new cases of diabetes
3. Early detection of new cases.
4. Prescription and use of drugs(availability of anti-diabetic medicines including insulin)
5. Home care
6. Monitoring of patient condition
7. Foot care
8. Dealing with complications
9. Using alternative medicine
10. Location of the pharmacy(urban, rural)
11. Referral of cases

To answer this question (Q1), the frequencies and percentages for variables of pharmaceutical practice were measured.

As noted from table (2):Pharmaceutical practice related to diabetes; that 26% of the pharmacists has attended courses related to diabetes management while 36% of the pharmacists has answered that they have attended and participated in conferences related to diabetes, on the other hand 47% of the pharmacists read medical journals and articles related to diabetes based on regular base, while only 20% of the pharmacists are members of organizations and committees that takes part regarding the diabetes management.

In additions the mean and the standard deviations has been calculated for each subject of the questionnaire and has been ordered in accordance with the degree of acceptance.

A review of the results shown in table (3):**(**Activities held by pharmacists toward diabetic patients);pointed out that the respondents agree on the role of the pharmacist in diabetes treatment significantly(PV= 0.05) (often) as the average total score for answers subjects (2.7905) with a standard deviation (0.5967) and this reflects the status of many services provided by the pharmacists in Hebron district. See table (3)

This also includes guiding the patient about the importance of foot care, counseling patients on the normal levels of glucose in the blood, in addition providing basic information about the importance of diet for diabetics, informing the patient about the time to take medications, and providing basic information about sports. Where these are considered as positive impact on patients with diabetes, guiding patients on the appropriate way to use insulin injections. and how to get rid of it ,explaining to the patient the risks of high blood pressure on patients with diabetes , counseling patients on the appropriate way to use insulin pens and how to get rid of

them, explaining the risk of diabetic retinopathy, counseling patients on the appropriate times to check blood glucose. These services which are provided to patients with diabetes were ranked from one to ten by grade.

While there were some services that were rarely (seldom)offered by pharmacists the following services for patients with diabetes from the use of alternative medicine such as herbal preparations and natural, diagnosing symptoms secondary to the disease after the discovery of a case, referring patients with diabetes to a social worker, referring a patients with diabetes to an educational program about the disease, and doing routinely check the blood glucose for the undiagnosed cases in the pharmacy

Answering the question of

Q2:What is the status of services provided by the pharmacist for diabetic patients?

To answer the question the averages and the standard deviations were calculated for all paragraphs of the questionnaire, and the order of the paragraphs of each resulted value in descending order according to the degree of approval shown in Tables (4,5,6, and 7) of the pharmacists practices between the results of the analysis

Reviewing the results shown in Table 4, it is noted that respondents agree about the role of the pharmacist in early screening for diabetes significantly (much) as the average total score for answers subjects (2.5260) and standard deviation (0.71104), where often advised patients with overweight, to reduce their weight through following better diets, and advised to consider diets with low sugar ratio (beans, lentils, oatmeal, fruit unsweetened) as a source of carbohydrates in their diet, and alerting people exposed to the disease or diagnosis of pre-diabetes and tutor to adjust the pattern life.

While rarely pharmacists diagnose secondary symptoms of the disease after the discovery of a new case, and rarely do a blood test for undiagnosed cases at their pharmacies and this could be due to lack of time.

Results shown in Table 5 that pharmacists often in monitor blood glucose for diabetic patients, with an average total score for answers subjects (2.822+) and standard deviation of (0.73802), where often pharmacists advice patients on the normal values of glucose in their blood, and the appropriate times to check glucose in blood, Counsel on the appropriate times to check blood glucose, and to identify possible causes of the values of abnormal blood glucose, and help patients interpret measurements examine the cumulative diabetes HbA1C, and recommend drug therapy for a doctor to help patients to achieve the desired goals for blood sugar.

Analyzed figures in Table7; shows the role of the pharmacist in a historic evaluation (drug history: which pharmacists are especially suited to conducting medication history interviews, as they are familiar with drug names, effects, dosage forms, and administration than other health care personnel. They can readily identify inconsistencies and mistakes in patients' self-reported medication histories. They also have the expertise and experience to optimize a patient's drug therapy through clinical interventions)(Badowski, Rosenbloom, & Dawson, 1984).

This includes medicines coupled as an average total score for answers subjects (2.5670) and standard deviation (0.90031) where occupied paragraph (47) and to standard pharmacists to dispersion in the practice of this role.

Pharmacist has shown positive attitude toward the appropriate use of medication which was mainly by providing patient-specific interventions to help improve adherence in addition to counseling about the cautions of over-the-counter drugs (OTC), and identify the barriers for good

drug adherence which is defined as the extent to which patients take medications as prescribed by their health care providers(Osterberg & Blaschke 2005). See Table 8: Diabetes Management.

Pharmacists has shown positive attitudes towards counseling their customers on the appropriate use and administration of insulin products that include the proper use ,timing ,and explaining for them about the use of insulin needles and syringes however these results are clearly shown on Table 9.

On the other hand pharmacists show positive attitude and welling to discuss for their patients about the proper use of oral anti diabetic medication that include appropriate time for taking the medication ,mechanism of action of these medication and about possible adverse effects that may affect these patients (Table 10)

Pharmacists; has also shown a positive attitude toward dealing with the complication that may accompany the diabetes (like hypertension). This was highly reported in providing education on the importance of controlling blood pressure in diabetes, guiding the patient about the normal blood pressure measurements, counseling their customers on the risk factors for both retinopathy and nephropathy in diabetes were also highly reported. See Table11.

Pharmacist are giving advices often for the patients about good foot care techniques, and counseling their patients on how to deal with symptoms of the neuropathic pains that may arise. Also they address for their customers about the importance of regular screening for the neuropathic pains Table 12.

Regarding the life style modification aspect; it was noticed that a frequently advices and education was provided to diabetic patients. This was mainly provided through basic information on proper diet and

exercises, in addition of advising smokers regarding the risk of smoking of continued tobacco use. See Table 13.

Q4.what are the main obstacles that impede pharmacists from playing the role in managing diabetic management?

As reported; time constrain was the mostly reported one with frequencies of 31 respondents while the lack of patient response to the advice came in the second rank of respondents with frequencies of 30 respondents, at the fourth order the lack of incentive was reported as one of the main obstacles that impede these pharmacists in dealing with diabetic patients. Table(A)

The following points were reported with frequencies less than 10

- Lack of training and lack of patient response to advise
- The lack of qualified medical teams
- Lack of patient's follow up
- Lack of programs for supporting diabetic patients
- The existence of weak health care system that doesn't offer the appropriate care for patients

5.3 Research's' answers of hypothesizes (Q.3)

- **First Hypothesizes**: To test the validity of the following null hypothesis:

  There were no statistically significant relationship between the variable of age groups and the role of the pharmacist in the treatment of patients with diabetes.

  The chi-square test has been used in order to determine a relationship between two variables (age of the pharmacist, the pharmacist's role in the treatment of patients with diabetes).

Noted from these results that the value of chi-squared (29.421) function is statistically significant at ($\alpha \leq 0.01$), reaching P value= (0.001), and therefore the null hypothesis is rejected, meaning that there are differences between the expected and the real cumulative and these differences are statistically significant and is no longer to serendipity factor, which means that the role of the pharmacist in the treatment of diabetic patients is being affected by the age.

- **Second hypothesis:** To test the validity of the following zero hypothesis:

There was no statistically significant relationship between the role of the pharmacist in the treatment of patients with diabetes and his working in another pharmacy variable.

The chi-squared test has been used to determine a relationship between two variables (the role of the pharmacist in the treatment of patients with diabetes, the work of the pharmacist in another pharmacy).

It is Noted from these results that the value of chi-squared (37.586) function is statistically significant at ($\alpha \leq 0.01$), reaching P value =0.001), and therefore the null hypothesis is rejected, meaning that there were differences between the expected and the real commutative and these differences are statistically significant and no longer to serendipity factor, which means that the role of the pharmacist in the treatment of patients with diabetes is influenced by his work in another pharmacy

- **Third hypothesis**: to test the validity of the following zero hypothesis:

There was no statistically significant differences at the level of significance of (0.05) from the point of Pharmacists of view about their role in the treatment of diabetes patients are due to each of the following variables (pharmacy site, relationship of pharmacist to the pharmacy, previously

taking courses or training, attend conferences, read private medical journals, being a member in a foundation specialized in the treatment of patients with diabetes).

According to the results there was a non-statistically significant differences at the level of significance (0.05) from the pharmacists point view in accordance about their role in the treatment of diabetic patients due to the variable sex as the value of "T" (0,778)which is a not statistically significant, which means that male pharmacists are not different from females in their role in the treatment of patients with diabetes.

But on the other hand the results show a presence of statistically significant differences at the level of significance (0.05) from the point of view of Pharmacists about their role in the treatment of diabetic patients due to the variable of pharmacy site , pharmacists in the villages for the benefit of reaching T (2.419), a statistically significance, especially with regard to the treatment of hypoglycemia , and treatment of diseases associated with diabetes, and take care of diabetic foot, and referring cases to specialists, which means that pharmacists in the villages have more positive performance of their role in the treatment of patients with diabetes for pharmacists colleagues of those in the urban communities. This could be due to the availability of specialists in the city, and the hesitation of patients in the villages of going to the physician. Also it could be due to the more time availability (free time), that the pharmacists have in rural areas, but lack of time, and more life pressure lies on pharmacists in the urban areas.

Also the results show a non-statistically significant differences at the level of significance (0.05) from the point of Pharmacists of view about their role in the treatment of diabetic patients due to the variable pharmacist (owner\ employees) as the value of "T" (0,309) which is a non-statistically significant. This means that the pharmacies' owners and the non-owner pharmacists do not differ from pharmacists' staff in their role in the treatment of patients with diabetes.

While the results indicates the presence of statistically significant differences at the level of significance (0.05) from the point of view Pharmacists about their role in the treatment of diabetic patients due to the variable of receiving training courses for the prevention and treatment of diabetes , pharmacists who are enrolled in these courses for the benefit of reaching "T" value of (1.997),which is a statistically significant value, especially with regard to refereeing of the cases to the specialists, which means that the pharmacists who are enrolled in training courses will refer the diabetic patients to specialists more than their colleagues who did not attend these courses .

In addition; there is a non-statistically significant differences at the level of significance (0.05) from the point of view Pharmacists about their role in the treatment of diabetic patients due to the variable of degree of the pharmacist as the value of "T" (0,850) which is a non-statistically significant, which means that pharmacists who hold graduate degrees do not differ from pharmacists who hold bachelor's degrees in their role in the treatment of patients with diabetes.

This may be due to the small size of sample of the upper degrees where the number of masters holders are seven pharmacists, and the number of Doctorate certificates holders are two pharmacists.

Also; and according to the findings, there were non-statistically significant differences at the level of significance (0.05) from the point of Pharmacists of view about their role in the treatment of diabetic patients due to the variable of attending a conference related to treating of diabetes as the value of "T" (0.747.) which means that pharmacists who attended the conference do not differ from pharmacists who did not attend conferences related to treatment of diabetic patients.

The results show presence of statistically significant differences at the level of significance (0.05) from the point of view Pharmacists about their role in the treatment of diabetic patients due to the variable of reading medical journals about diabetes in periodic times, in other words pharmacists who read medical journals has a score of "T" (2.384)which a statistically significant, especially with regard to the treatment of hypoglycemic patients, besides treatment of diseases associated with diabetes, in addition to the treatment of patients with diabetes who use oral medication and the early detection and prevention of diabetes treatment.

The results did not indicate differences at the level of significance (0.05) from the point of view of the pharmacists, regarding their role in the treatment of diabetic patients due to the variable of participation in any organization or association which has a role in the treatment of diabetes ,as the value of "T "(0.587) which a non-statistically significant value. This means that pharmacists who are participants in such organizations are not different from their colleagues of non-participants pharmacists.

- **Fourth hypothesis**: to test the validity of the following zero hypothesis:

  There is no significant differences at the level of significance (0.05) from the point of view of pharmacists about their role in the treatment of patients with diabetes are due for each of the following variables (number of employees in the pharmacy, years of experience, age groups pharmacist).

  To answer the fourth hypothesis test a unilateral variation of the following three tables and analysis of results of the analysis show

  It was found that there were no statistically significant differences at the level of significance (0.05) from the point of view of Pharmacists about their role in the treatment of diabetic

patients regarding the variable of number of employees in the pharmacy, where the value of f reached ((2.032), which means that pharmacists do not differ in their role in the treatment of patients with diabetes depending on the number of employees in the pharmacy. On the other hand the post-test groups heterogeneous LSD showed the existence of differences between the third group (more than 2 employees) and the second group (2 employees only) in the following four areas: glucose control in the blood and the treatment of diabetes, drug therapy for patients with diabetes who use insulin and the early detection of diabetes in favor of the existence of more than those working in the pharmacy.

Post-test groups heterogeneous also showed the existence of differences between the third group (more than employees) and the second group (employees only) in the following three areas: controlling glucose in the blood and drug therapy for patients with diabetes who use insulin and the early detection of diabetes in favor of the existence of more than workers in pharmacy.

This may be due to the fact that every worker may think that his colleague had the expected role instead of him.

On the other hand it was found that there were no statistically significant differences at the level of significance (0.05) from the point of view of Pharmacists about their role in the treatment of diabetic patients and the variable age groups pharmacists, amounted value of f (.0853) which is not statistically significant, which means that pharmacists do not differ in their role in the treatment of diabetic patients within different age categories.

However it has been found that there is a statistically significant relationship role of the pharmacist in the treatment of patients with diabetes and the years of experience of the

pharmacist. The relationship has been reached (0.649) between the role of the pharmacist in the treatment of patients with diabetes and years of experience between the pharmacist and a positive relationship medium, which means that the more years of experience pharmacist reflected positively on his/her role in the treatment of patients with diabetes.

Chapter Six

Discussion and Conclusion

6.1 Questionnaires' answered analysis

The community pharmacist role is not only limited to dispensing prescribed medicines.

Pharmacists are skilled at identifying adherence problems and addressing adverse drug effects, and many pharmacists are trained to educate and motivate patients on diet, exercise, and diabetes self-care activities(George, Molina, Cheah, Chan, & Lim, 2010).

In addition they can also identify adherence problems and manage adverse drug effects besides they have a significant training in the pharmacotherapy of diabetes and cardiovascular disease and can make valuable drug therapy recommendations to physicians ,in addition many pharmacists are trained to educate and motivate patients on diet, exercise, and diabetes self-care activities.(Doucette, Witry, Farris, & McDonough, 2009)

However in this section; a coherent discussion is meant to take place for this study;to highlight the current community pharmacists' role and practices toward diabetes management, based on the results of the research questions, and going through a description of these activities and its extent. Then; a further discussion will be focused on the research hypothesis.

It was clear that the aforementioned practices and activities are undertaken by pharmacists in different degrees and extents and they were resembled and described as follows:

The recently diagnosed new cases of diabetes: Apparently; pharmacists are doing activities in often way regarding this issue, mainly by giving advices for the overweighed patients, to enhance their eating habits, to reduce their weight, including tailored advices to carefully select

food with low sugar ratio. Also; alerting people exposed to the disease or diagnosis of pre-diabetes and guide them to adjust their life pattern and this complies with a research held in Nigeria (Bello, Ganiyu, Dakop, & Erah, 2012) ,also to another study in Pakistan (Zia ur, Khan, Gaohar, Baig, & Khan, 2014) .

While rarely pharmacists diagnose or give education about secondary symptoms of the disease following the discovery of a new case, and rarely do a blood test for undiagnosed cases at their pharmacies and these findings are similar to the finding of (Shatnawi & Latif, 2016).

This could be due to lack of time and the absence of blood sugar monitors in their pharmacies, or could be due to that pharmacists may belief that this is a responsibility of other health professional.

Results shown the role of the pharmacist often monitor blood glucose for diabetes, where often pharmacists advice patients on the normal values of glucose in their blood, and the appropriate times to check glucose in blood, Counsel on the appropriate times to check blood glucose, and to identify possible causes of the values of abnormal blood glucose, and help patients interpret measurements examine the cumulative diabetes HbA1C.

Results have indicate that; Pharmacists often give advices to their patients, regarding the proper dealing with the diabetes complication. This has been clearly shown in the related activities by providing education about the importance of controlling and monitoring blood pressure that may be accompanied with diabetes. Also a role in counseling on the current treatment targets for blood pressure, in addition to provide education on the importance of regular screening for retinopathy.

The issue of giving advices and counseling regarding the proper using of alternative medicine were rarely served by these community pharmacists, so when talking about the proper use of herbal medication Pharmacists has shown a weakness in this field, and this may be due to lack of knowledge about the mechanism of action of these products and its proper use, however this result complies with a result of local cross sectional (Community Pharmacists' Medication Knowledge: A Nation-wide Study in Palestine) that show a similar result about such weakness of knowledge about these herbal products use.

The issue of patient referral to a specialist is considered to be one of the most important aspects in the role of pharmacists in diabetes management. (Campbell, 2002)It has been noticed however in this study, that pharmacists show a weakness in this field and this finding was similar to the finding of (Bhojani et al., 2014),and this weakness has been shown especially when referring to a social worker and this could be due to mainly the lack of institutions and personnel (not popular) that serve such services for the diabetic patients, on the other hand; there were rarely reporting in referral to a diabetic educational program and this could be due to the lack of awareness of the presence of these programs within the pharmacists populations.

Nevertheless the most commonly referral by the Pharmacists was referring to an Ophthalmologist, however this finding is similar to the finding of (Jimenez-Ramirez & Perez, 2011), and this could be due to the fact that eye diseases are the most common problems during diabetes. Table 14.

When discussing the obstacles that impede the community pharmacist from offering the services for the diabetic patients, time constrain came in the first rank, and it was obvious that community pharmacist who has less pressure of work has much more time of serving such services ,lack of patient response came in the second rank and this could be due to that patients has lack of

awareness about the medical advices and some still perceive that medicines supply remains the principal role of the community pharmacist, lack of incentive or compensation came in the third rank because in most of time patients doesn't pay for these services most of time seeking to dispense their medication from the pharmacies that offer the lowest prices and don't appreciate the quality of services they receive ,however these main barriers were also reported in several studies worldwide one study was in Iowa (Barriers to Community Pharmacists' Provision of Diabetes Care Services in Iowa(Plake, Chesnut, & Odorzynski, 2007) in which reimbursement, work load and lack of time were the most reported barriers.

However; extra research is still required in this field, in order to address the obstacles, and underline the importance of having a deep knowledge concerning the reasons stand behind them.

6.2 Hypotheses analysis

The analyzed hypotheses showed that the demographic variables have different and varied impacts on the role of Pharmacists in Diabetes management. Commencing with age variable; it has been noticed that Pharmacist role in diabetes management is affected by age and this could be due to accumulative experience they have.

The gender responses; did not have any resulted difference wither this service is given by a female pharmacist or a male Pharmacist.

Community pharmacists in the rural areas have shown preference in giving the diabetic activities over those in the urban areas especially with regard to the treatment of hypoglycemia(low blood glucose) and this complies with findings of (Ryan et al., 2012), treatment of diseases associated with diabetes, taking care of diabetic foot which complies with findings of , and refereeing the

cases to specialists, which means that pharmacists in the villages differ in the performance of their role in the treatment of patients with diabetes for pharmacists colleagues in the urban maybe it was due to the availability of specialists in the city, and the hesitation of patients in the villages of going to the doctor, also it could be due to the longer time that the pharmacists have in the rural areas .

The ownership of the pharmacy hasn't shown a significant difference in providing the diabetic services, which means that the owners of pharmacies and the non-owner pharmacists do not differ from pharmacists staff in their role in the treatment of patients with diabetes.

pharmacists who were enrolled in courses related to diabetes management has shown preference in providing these services over the pharmacists who didn't and this finding is similar to the finding of (Simpson et al., 2009) , especially when talk about refereeing the cases to the specialists, which means that the pharmacists who are enrolled in training courses will transfer the diabetic patients to specialists more than their colleagues who did not attend these courses .

The obtained university degree of the community pharmacists, has not played a role in providing these services, which means that pharmacists who hold master or PhD degrees do not differ from pharmacists who hold bachelor's degrees in their role in the diabetic patients' treatment.

However further investigation is needed regarding this point because basically due to the small size of sample of the upper degrees where the number of masters holders are 7 and the number of certificates Doctorate holders are only 2 degree holders.

Attending conferences related to diabetes hasn't played a significant role in giving these services which means that pharmacists who attended the conference do not differ from pharmacists who did not attend conferences related to treatment of diabetic patients.

Being a part of an organization related to diabetes has also shown similar results to the point of attending conferences, which means that pharmacists who are participants in such organizations are not different from their colleagues of nonparticipant's pharmacists.

But when come into reading the medical journals about diabetes in periodic times, Pharmacists who used to read showed a significant difference over those who used not to read, especially with regard to the treatment of hypoglycemic patients, treatment of diseases associated with diabetes, in addition to the treatment of patients with diabetes who use oral medication and the early detection and prevention of diabetes treatment.

The number of employees in the Pharmacists means that pharmacists do not differ in their role in the treatment of patients with diabetes depending on the number of employees in the pharmacy.

But on the other hand the post-test groups heterogeneous LSD showed the existence of differences between the third group (more than 2 employees) and the second group (2 employees only) in the following four areas: glucose control in the blood and the treatment of diabetes, drug therapy for patients with diabetes who use insulin and the early detection of diabetes in favor of the existence of more than those working in the pharmacy. This could be due to the fact that all of the workers may think that his colleague had the expected role instead of him.

Finally this is to conclude that despite the fact that still the community pharmacy practice in Palestine toward chronic disease and diabetes management is still immature and not programmatic but still there is a good opportunities to work on for favor of the patient care .

6.3 Limitations of the research

Although this research was carefully prepared, limitations were inevitable for a number of reasons; firstly, the research was conducted in Hebron district only, which does not imply that it will be representative for the whole Palestinian territories and other Palestinian districts.

Secondly; knowing that the sample was a convenient one; means it is of less strength than being implemented as a random one. Furthermore; the research targeted community pharmacists in their private pharmacies, but did not cover others pharmacists working in the public sector like hospitals, and clinics.

6.4 Conclusion

The main conclusions found throughout this thesis are as follows:

1. Community pharmacists in Hebron district are experiencing a positive attitude and willing to help patients suffering from diabetes.
2. Community pharmacists generally provide the service or answer questions asked by the patients.
3. Community pharmacists do not differ in their role in the management and support given to diabetic patients based on different educational levels, or years of experience
4. Time constraints and the lack of patient response to the advice was the most reported obstacles in providing diabetic services.

6.5 Recommendations

Based on the research results and conclusions; the following recommendations are important to be applied on the national level:

1. The importance of engagement of the community pharmacists in any future plan for treating and management possible life threats of diabetic patients
2. There is a need from the health authorities and Pharmacists Association to improve the community pharmacists' role in healthcare system by providing continuous education, support and awareness.
3. The need to do awareness campaigns for the diabetic patients concerning the need of a specialized physician referrals.
4. Awareness campaigns for diabetic patients to encourage them about asking their community pharmacists about diabetes and its treatments and control.
5. National diabetes education programs should incorporate pharmacists as active participants by adapting established working models to the local needs and circumstances.

Annex 1, Survey Questionnaire

استبيان عن دور الصيدلي في علاج مرضى السكري

اولا : المعلومات الديموغرافية :-

1-1 العمر بالسنوات :--------- ----------

2- 1 الجنس :

أ- ذكر ب- انثى

1-3 موقع الصيدلية التي تعمل بها.:

أ- قرية ب- مدينة

4- 1 الدرجة الجامعية للصيدلي :

أ– بكالوريوس ب- ماجستير ج- دكتوراه

5- 1هل انت بالنسبة للصيدلية :

أ- مالك ب- موظف

6- 1 عدد العاملين بالصيدلية(يشمل المساعدين) : _____

1-7 عدد سنوات الخبرة في ممارسة مهنه الصيدلة:_____

8- 1هل تعمل في صيدلية اخرى :

1- نعم 2 – لا

ثانيا : الممارسة الصيدلانية المتعلقة بمرضى السكري

2-1 هل سبق وقمت بتلقي دورات تدريبية للوقاية والعلاج من لمرضى السكري

أ- نعم ب – لا

2-2هل سبق وان حضرت مؤتمر خاص بعلاج مرضى السكري

ب- نعم ب – لا

2-3 هل تقوم بقراءة المجلات الطبية الخاصة بالمرض بشكل دوري ؟

أ- نعم ب – لا

2-4هل انت مشارك بأي شكل من الاشكال في أي مؤسسة او جمعية لها دور في علاج المرض .

أ- نعم ب – لا

ثالثا : الخدمات التي يوفرها الصيدلي لمرضى السكري : -

العبارات التالي(من السؤال 1-49) تصف الخدمات التي يوفرها الصيادلة لمرضى السكري :-

ملاحظة : (يرجى الاشارة الى النسبة المؤية مراعيا المقاييس التالية)

1- **لا اوفر : لا اوفر هذة الخدمة لمرضى السكري .**
2- **نادرا : اقوم بتوفير هذة الخدمة ل 25% من المرضى .**
3- **كثير من الاحيان : اقوم بتوفير هذة الخدمة لحوالي 75 % من المرضى .**
4- **دائما : اقوم بتوفير هذة الخدمة لحوالي 100% من المرضى .**

الكشف المبكر والوقاية من مرض السكري

1- **اقوم بشكل اعتيادي بعمل فحص دم للحالات الغير مشخصة بصيدليتي :-**

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

2- **اقوم بتشخيص اعراض ثانوية للمرض بعد اكتشاف الحاله ..**

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

3- أقوم بتنبية الاشخاص المعرضين للإصابة بالمرض أو تشخيص مرحلة ما قبل السكري وإرشادهم الى تعديل نمط الحياه ..

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

4- انصح المرضى الذين يعانون من الوزن الزائد ، بتقليل الوزن عن طريق تقليل تناول الطعام ..

أ- اوفر ب- نادرا ج – كثيرا د-دائما

5- انصح جميع المرضى بتناول اطعمة ذات نسبة سكر منخفضة (الفول , العدس , الشوفان , الفاكهه غير المحلاة) كمصدر للكبيوهديرات في وجباتهم

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

6- اقوم بارشاد المرضى على كيفية استخدام فحص الدم البيتي , بما في ذلك كيفية اخذ عينة .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

7- اقوم بارشاد المرضى على الاوقات المناسبة للتحقق من نسبة الجلوكوز بالدم .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

8- اقوم بارشاد المرضى على النسبة الطبيعية للجلوكوز في الدم .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

9- اقوم بمساعد المرضى على تفسير قياسات فحص السكري التراكمي (A1C)

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

10- اقوم بتحديد الاسباب المحتملة للقيم الغير طبيعية للسكر في الدم .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

11- اقدم توصيات لعلاج الدوائي للطبيب لمساعده المرضى لبلوغ الاهداف المرجوة لنسبه السكر في الدم .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

علاج هبوط السكر في الدم

12- اقوم بأرشاد المريض على علامات نقص السكر في الدم .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

13- اقوم بتحديد الاسباب المحتملة لنقص السكري في الدم .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

14- اقوم بتحديد نسبة تردد نوبات هبوط السكر في الدم.

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

15- اقوم بتقديم توصيات لعلاج هبوط السكر في الدم.

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

العلاج الدوائي- العام

16- اجراء تقييم تاريخي (DRUG HISTORY) والذي يتضمن .

أ- الادوية المقرونة بوصفه .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

ب- المستحضرات العشبية والطبيعية .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

ت- الادوية التي لا تحتاج الى وصفات طبية (OTC):

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

17- اقوم بأعلام المرضى عن محاذير الادوية الغير مصحوبة بوصفه طبيه (OTC) .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

18- اقوم باعلام المرضى عن محاذير استخدام المستحضرات العشبية ذات صله بعلاج المرض .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

19- تحديد العوائق التي تحول دون التقييد بالمواظبة على استعمال الدواء .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

20- توفير النصائح التي تساعد على الالتزام بتناول الدواء في الاوقات المحدده.

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

العلاج الدوائي لمرضى السكري الذين يتعاطون انسولين :

21- اقوم بارشاد المرضى على الطريقه المناسبة لاستخدام حقن الانسولين وكيفيه التخلص منه .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

22- اقوم بإرشاد المرضى على الطريقه المناسبة لاستخدام اقلام الانسولين وكيفية التخلص منها

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

23- اقوم بأعلام المرضى عن كيفيه عمل الانسولين وعن الاختلافات الرئيسية بين مستحضرات الانسلوين .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

24- اقوم بارشاد المرضى عن كيفيه تعاطي الانسلوين (الموقع , والتوقيت والتغيير في موقع الحقن) **أ- لا اوفر ب- نادرا ج – كثيرا د-دائما**

خاص بمرضى السكري الذين يتعاطون العلاج عن طريق الفم

25- اقوم بوصف اليه العمل لادوية السكري التي تؤخذ عن الفم :

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

26- اعلام المريض بالوقت المناسب لتعاطي هذا النوع من الادوية :

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

27- اعلام المريض بالأضرار الجانبية المحتملة لتناول هذا النوع من الادوية .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

علاج الامراض المصاحبة لمرضى السكري

28- اقوم بأرشاد المريض على التوصيات الحاليه لعلاج مضاد الصفيحيات (e.g aspirin(anti- platlet)

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

29- اقوم بأرشاد المريض على النتائج الطبيعية للضغط الدم..

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

30- اشرح للمريض اهمية علاج ضغط الدم لمرضى السكري .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

31- اقوم بمراجعه قياسات دم المريض لتحديد القيم الغير طبيعية.

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

32- اقوم بالسؤال عن الادوية التي يتعاطاها المريض للكشف عن اسباب ارتفاع الضغط(ان وجد)

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

33- اقوم بارشاد المريض المصاب بالسكري عن القيم الطبيعية لمستوى الكولسترول في الدم.

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

34- اقوم بشرح الاثار السلبية للأكتئاب على مريض السكري .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

35- اقوم بشرح خطورة مرض السكري على الكليتين .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

36- اقوم بأرشاد المريض على اهمية الفحص المنتظم لاعتلال الكلية .على سبيل المثال (كيفيه عمل الفحص ، وأمكنة الحصول على الفحص) .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

37- شرح وظائف الكليتين والمراحل المختلفة من امراض الكلى ..

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

38- السؤال عن الادوية التي يستخدمها المريض للتعرف على الانواع التي يتم التخلص منها عن طريق الكلية.

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

39- اقوم بشرح خطر مرض السكري على اعتلال شبكية العين .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

12 – ارشاد المريض على اهمية القيام بفحوصات دورية للحفاظ على شبكية العين .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

40- ارشاد المريض على اعراض خدر الاطراف(diabetic neuropathy) المصاحب لمرض السكري .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

41- ارشاد المريض على اهمية عمل الفحوصات الدورية للكشف عن اعراض خدر الاطراف .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

42- ارشاد المريض عن اهمية العناية بالقدم .

أ - لا اوفر ب- نادرا ج – كثيرا د-دائما

الحياة الصحية لمرضى السكري :

43- توعيه المرضى المدخنين عن خطورة استمرارهم بالتدخين .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

44- ارشاد المرضى المدخنين على الوسائل المساعده عن الاقلاع على التدخين .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

45- توعية المرضى على اهمية اخد تطعيم الانفلونزا لمرضى السكري

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

46- توعية المريض على اهمية العناية بالأسنان وعمل فحوصات دورية للأسنان

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

47- تقديم معلومات اساسية عن اهمية الحمية الغذائية لمرضى السكري .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

48- تقديم معلومات اساسية عن الرياضه واثرها الايجابي على مرضى السكري .

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

49- اقوم بإرشاد مرضى السكري على مايلي :

1- برنامج تعليمي عن المرض :

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

2- خبير تغذيه :

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

3- طبيب عيون :

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

4- اخصائي اجتماعي :

أ- لا اوفر ب- نادرا ج – كثيرا د-دائما

50- هل يوجد خدمات اخرى تقوم بتقديمها لمرضى السكري لم يتم ذكرها في الاستبيان وماهي تلك الخدمات ان وجدت :

_____

_____

51- في رأيك ما هو العائق الاساسي في عدم تقديم العلاج المناسب لمرضى السكري (الرجاء اختيار اجابه واحده من الاتي)

1- ضيق الوقت .
2- نقص التدريب .
3- غياب الحوافز .
4- عدم استجابة المريض للنصح .
5- عوامل اخرى (الرجاء ذكرها):

_____

_____

مع فائق الاحترام والشكر

Annex2, Tables of surveys' statistical analysis

Reference to the designed survey questionnaire attached in annex 1, a statistical analysis was performed to analyze the collected responses.

Through the annex, tables are listed to present the used variables and resulted analysis for each group of questions:

Table (1):operational variables

The research depends on the following main variable		
1	Age	Refers to the age of the community pharmacists
2	Gender	Refers to the gender of the community pharmacist
3	Practice	Refers to the ways in which they demonstrate their knowledge and attitude through their actions for diabetes practice.
4	Years of experience	Refers to the years of experience gained by the community pharmacist as working in the community pharmacy .
5	University degree	Refers to the certificate that the community pharmacy have (BA,Master,Phd) .
6	Size of staff	Indicated number of workers at the community pharmacy in which the selected community pharmacist works
7	Previous training in diabetes management	Indicated wither the community pharmacist has /hasn't previous training experience in diabetes management.
8	Employer vs. employee at the pharmacy	Indicated if the community pharmacist is an employee /or employer for the community pharmacy
9	Urban vs rural community pharmacists	Indicates wither the community pharmacy is from the urban or the rural area of Hebron district .
10	Sources of knowledge	the source which the community pharmacist majorly depends on his knowledge of diabetes (medical journal, conferences, university)

Pharmaceutical practice

Table (2):Pharmaceutical practice related to diabetes

Variable	Level	Number	Percent 100%
Training Period(course)	Yes	26	**26**
	No	74	**74**
	Total	100	**100**
Conference Attendance	Yes	36	**36**
	No	63	**63**
	Total	99	**99**
	Missing System	1	**1**
	Total	100	**100**
Medical Journal Reading	Yes	47	**47**
	No	53	**53**
	Total	100	**100**
Society Participation	Yes	20	**20**
	No	80	**80**
	Total	100	**100**

Table (3): Activities held by pharmacists toward diabetic patients

Item No.	Item	N	Mean	SD	Order	Degree
42	Guide the patients about the importance of foot care.	96	3.17	2.122	1	**Often**
8	tuiding the patietnts aboug blood glucose normal values	99	3.04	.807	2	**Often**
47	Providing basic information about the importance of diet for diabetic patients	96	3.03	.787	3	**Often**
26	nforming the patient about the proper time of taking diabtis medications	100	3.01	.731	4	**Often**
48	Provide basic information about sports and its positive impact on patients with diabetes.	97	2.98	.835	5	**Often**
21	I do patients guidance on the appropriate way to use insulin injections and how to get rid of it.	100	2.94	.885	6	**Often**
30	Explain the importance of management high blood pressure on patients with diabetes	100	2.94	.678	7	**Often**
22	Counsel on the appropriate use of syringes and needles (e.g., sharpdisposal).	99	2.92	.895	8	**Often**
39	Counsel on the risk factors for retinopathy in diabetes	100	2.92	.787	9	**Often**
7	Folk patients' guidance on the appropriate times to check blood glucose.	99	2.91	.829	10	**Often**
43	Provide smokers with education on the risks of continued tobacco use.	98	2.91	.782	11	**Often**
12	Counsel on signs and symptoms of hypoglycemia	100	2.91	.829	12	**Often**
29	Review the patient's recent blood pressure measurements to identify abnormal values	100	2.90	.611	13	**Often**
6	Counsel on the use of a blood glucose meter, including how to obtain a blood Sample.	99	2.89	.826	14	**Often**

24	Counsel on the appropriate use of insulin pens	97	2.89	.895	15	**Often**
20	Provide patient-specific interventions to help improve adherence.	100	2.89	.764	16	**Often**
40	Counsel on the symptoms of neuropathic pain.	95	2.88	.823	17	**Often**
25	Describe the mechanism of action for each oral anti diabetic drug.	100	2.88	2.011	18	**Often**
41	Provide education on the importance of regular screening for neuropathicpain.	96	2.87	.836	19	**Often**
12	Guiding the patient about the signs of Hypolglycemia	94	2.86	.797	20	**Often**
35	Counsel on the risk factors for nephropathy in diabetes.	99	2.84	.800	21	**Often**
27	Describe potential adverse effects of each oral anti diabetic drug.	99	2.84	.812	22	**Often**
13	Identify possible causes of hypoglycemia	98	2.84	.791	23	**Often**
33	Counsel on the current treatment targets for cholesterol in diabetes	98	2.84	.804	24	**Often**
4	Recommend to the patients who suffer from overweight, reduce weight by reducing eat	100	2.84	.837	25	**Often**
23	Counsel on how insulin works and the key differences amongst insulin formulations	100	2.83	.853	26	**Often**
15	Provide recommendations for treatment of hypoglycemia to the patient	99	2.82	.821	27	**Often**
17	Counsel about the cautions of over-the-counter drugs as they relate to diabetes management.	98	2.82	.703	28	**Often**
32	Review the patient's drug profile to identify causes of abnormal blood pressure	100	2.82	.821	29	**Often**
49.3	Refereeing the patient to an ophthalmologist	99	2.80	.944	30	**Often**

44	Provide education on the effect depression can have on diabetes management	97	2.79	.853	31	**Often**
5	advise patients to eat foods with low percentage of sugar	100	2.78	.798	32	**Often**
10	Identify potential causes of abnormal blood glucose values	99	2.76	.805	33	**Often**
9	Counsel on the interpretation of A1C results	99	2.76	.890	34	**Often**
36	Provide education on the importance of regular screening for nephropathy	99	2.75	.904	35	**Often**
18	Counsel about the cautions of herbal products as they relate to diabetes management	98	2.74	.803	36	**Often**
19	Identify the barriers to good drug adherence	100	2.71	.728	37	**Often**
14	Identify frequency of hypoglycemic episodes	100	2.67	.899	38	**Often**
45	Provide education about the importance of immunization for influenza and pneumococcal pneumonia in diabetes	98	2.66	.860	39	**Often**
28	Counsel on current recommendations for antiplatelet therapy (e.g., low doseacetylsalicylic acid).	100	2.65	.743	40	**Often**
3	I alert the people exposed to the disease or diagnosed of pre-diabetes stage and guide them to modify their life style	100	2.63	.824	41	**Often**
16c	Asking about Drug history	95	2.60	.804	42	**Often**
38	Review the patient's drug profile to identify drugs that are renally cleared	99	2.59	.902	43	**Often**
34	Counsel on appropriate insulin administration (mixing insulin, injectiontechnique, timing of injection, rotation of sites).	99	2.59	.868	44	**Often**
46	Provide education about the importance of regular teeth brushing, flossing	98	2.59	.917	45	**Often**

	and dental examinations in diabetes.					
11	Provide recommendations for treatment of hypoglycemia to the patient	99	2.57	1.011	46	**Often**
16a	Historical evaluation for prescribed medications.	97	2.56	.900	47	**Often**
31	Review the patient's recent blood pressure measurements to identify abnormal values.	100	2.55	.891	48	**Often**
37	Counsel on renal function and the various stages of renal disease.	98	2.54	.910	49	**Often**
16b	Herbal and natural products	98	2.37	.879	50	**Seldom**
2	diagnosis of secondary symptoms of the disease after the discovery of the case	100	2.36	.835	51	**Seldom**
49.4	I do refer the patient to a social worker	98	2.29	1.356	52	**Seldom**
49.2	I do refer the patient to a nutrotuinist	98	2.26	.958	53	**Seldom**
49.1	I do refer the patient to an education program concerning diabetis	99	2.17	.958	54	**Seldom**
1	I do routinely check the blood glucose for the undiagnosed cases in the pharmacy	100	2.02	.942	55	**Seldom**
Pharmacy Total Role		63	2.79	O.59		Often

Table(4),practices related to Early detection of new case

The current practices of community pharmacists towards diabetes and diabetic patients in terms of: Early detection of new case Causes and consequences

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
4	Advising patients who are overweight, reducing weight by reducing eat (food consumption)	100	2.84	.837	25	**Often**
5	advise all patients to eat foods with a low sugar levels (beans, lentils, oats, unsweetened fruit) as a source of Carbohydrate in their diet	100	2.78	.798	32	**Often**
3	I alert the people exposed to the disease or diagnosed as pre-diabetes stage and guide them to make lifestyle modifications	100	2.63	.824	41	**Often**
2	diagnosis of secondary symptoms of the disease after the discovery of the case	100	2.36	.835	51	**Seldom**
1	I do routinely check the blood glucose for the undiagnosed cases in the pharmacy	100	2.02	.942	55	**Seldom**
Total degree		100	2.5	.711		Often

Table (5),Practices related to Monitoring of patient condition

The current practices of community pharmacists towards diabetes and diabetic patients interms of:Monitoring of patient condition (glucose in blood)

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
8	Counsel on the current treatment targets for blood glucose	99	3.04	.807	1	**Often**
7	Counsel on the appropriate times to check blood glucose	99	2.91	.829	2	**Often**
6	Counsel on the use of a blood glucose meter, including how to obtain a blood sample.	99	2.89	.826	3	**Often**
10	Identify potential causes of abnormal blood glucose values	99	2.76	.805	4	**Often**
9	Counsel on the interpretation of A1C results	99	2.76	.890	5	**Often**
	recommend drug therapy for doctor to help patients to achieve the desired goals for blood glucose	99	2.57	1.011	6	**Often**
Total Role		100	2.82	O.738		Often

Table (6),Practices related to monitoring of patient condition (Hypoglycemia)

The current practices of community pharmacists towards diabetes and diabetic patients in terms of:Monitoring of patient condition(Hypoglycemia)

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
12	Counsel on signs and symptoms of hypoglycemia.	100	2.91	.829	1	Often
13	Identify possible causes of hypoglycemia	98	2.84	.791	2	Often
15	Recommendations for treatment of hypoglycemia to the patient.	99	2.82	.821	3	Often
14	Identify frequency of hypoglycemic episodes	100	2.67	.899	4	Often
Total degree		**100**	**2.81**	**.769**	**Often**	

Table(7), Historical evaluation related to the use of drugs

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
16a	Historical evaluation included prescribed medicine	**97**	**2.56**	**.900**	**1**	**Often**

Table (8): Counseling patients on the appropriate use of the medications.

Item no.	Item	N	Mean	SD	Order	Degree
20	Provide patient-specific interventions to help improve adherence	100	2.89	0.764	1	Often
17	Counsel about the cautions of over-the-counter drugs as they relate to diabetes management.	98	2.82	.703	2	Often
18	Counsel about the cautions of herbal products as they relate to diabetes management	98	2.74	.803	3	Often
19	Identify the barriers for good drug adherence	100	2.71	.728	4	Often
16c	Over the counter medication	95	2.60	.804	5	Often
16a	drug history review for medicatios that need a prescribtions	97	2.56	.900	6	Often
16b	Asking about drug history for herbal medications	98	2.37	.879	7	Seldom
Total degree		**100**	**2.66**	**O.627**		**Often**

Table (9)Prescription and use of drugs(availability of anti diabetic medicines including insulin)

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
21	Counsel on the appropriate use of syringes and needles (e.g., sharp disposal).	100	2.94	.885	1	Often
22	Counsel on the appropriate use of syringes and needles (e.g., sharp disposal).	99	2.92	.895	2	Often
24	Counsel on appropriate insulin administration (mixing insulin, injection technique, timing of injection, rotation of sites).	97	2.89	.895	3	Often
23	Counsel on how insulin works and the key differences amongst insulin formulations.	100	2.83	.853	4	Often
Total Degree		**100**	**2.90**	**.818**		**Often**

Table (10) Prescription and use of drugs(availability of anti-diabetic medicines including insulin)

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
26	Describe the appropriate time to administer each oral anti diabetic drug	100	3.01	.731	1	Often
25	Describe the mechanism of action for each oral anti diabetic drug.	100	2.88	2.011	2	Often
27	Describe potential adverse effects of each oral anti diabetic drug.	99	2.84	.812	3	Often
Total Degree		**100**	**2.90**	**O.918**		**Often**

Table (11), Dealing with complications

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
30	Provide education on the importance of controlling blood pressure in diabetes.	100	2.94	.678	1	Often
39.1	Counsel on the risk factors for retinopathy in diabetes.	100	2.92	.787	2	Often
29	Counsel on the current treatment targets for blood pressure in diabetes.	100	2.90	.611	3	Often
39.2	Provide education on the importance of regular screening for retinopathy	94	2.86	.797	4	Often
35	Counsel on the risk factors for nephropathy in diabetes.	99	2.84	.800	5	Often
33	Counsel on the current treatment targets for cholesterol in diabetes	98	2.84	.804	6	Often
32	Review the patient's drug profile to identify causes of abnormal blood pressure.	100	2.82	.821	7	Often
36	Provide education on the importance of regular screening for nephropathy (e.g., the type of test, where to get the test done, how often to test).	99	2.75	.904	8	Often
28	Counsel on current recommendations for anti platelet therapy (e.g., low dose acetylsalicylic acid).	100	2.65	.743	9	Often
38	Review the patient's drug profile to identify drugs that are renal cleared	99	2.59	.902	10	Often
34	Counsel on symptoms of depression.	99	2.59	.868	11	Often
31	Review the patient's recent blood pressure measurements to identify abnormal values.	100	2.55	.891	12	Often
37	Counsel on renal function and the various stages of renal disease.	98	2.54	.910	13	Often
Total Degree		**100**	**2.75**	**O.640**		**Often**

Table (12), Foot care and Diabetic neuropathy

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
42	Counsel on good foot care techniques.	96	3.17	2.122	1	Often
40	Counsel on the symptoms of neuropathic pain	95	2.88	.823	17	Often
41	Provide education on the importance of regular screening for neuropathic pain.	96	2.87	.836	19	Often
Total Degree		**98**	**2.97**	**1.02**		**Often**

Table (13), Monitoring of patient condition:

life style modification for the or the diabetic patients

Item n.	Item	N	Mean	Std. Deviation	Order	Degree
47	Provide basic information on diet as it relates to diabetes management.	96	3.03	.787	1	Often
48	Provide basic information on exercise as it relates to diabetes management	97	2.98	.835	2	Often
43	Provide smokers with education on the risks of continued tobacco use.	98	2.91	.782	3	Often
44	Provide smokers with education on options to help with tobacco cessation	97	2.79	.853	4	Often
45	Provide education about the importance of immunization for influenza and pneumococcal pneumonia in diabetes.	98	2.66	.860	5	Often
46	Provide education about the importance of regular teeth brushing, flossing and dental examinations in diabetes.	98	2.59	.917	6	Often
Total Degree		**99**	**2.83**	**.695**		**Often**

Table (14), Referral of cases

Item n.	Item	N	Mean	SD	Order	Degree
49c	I do refer the patient to Ophthalmologist	99	2.80	.944	1	Often
49d	I do refer patient to social worker	98	2.29	1.356	2	Seldom
49b	I do refer patient to dietician	98	2.26	.958	3	Seldom
49a	I do refer patients to an educational program concerning diabetis	99	2.17	.958	4	Seldom
Total Degree		99	2.38	.838		**Seldom**

Table(A)Main obstacles that impede pharmacists from giving diabetes services .

Answering the question about the main obstacle in the absence of appropriate treatment for patients with diabetes

Number	Main obstacle	Frequencies
1	time constraints	30
2	Lack of patient response to the advice.	31
3	Lack of incentive	13
4	lack of training	11
5	Lack of training and lack of patient response to advise	4
6	The lack of qualified medical teams.	1
7	Lack of patient's follow up	2
8	Lack of programs for supporting diabetic patients	1
9	The existence of weak health care system that doesn't offer the appropriate care for patients.	1
		94
Missing answers		6
Total answering		100

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