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BARRIERS FACING PHYSICIANS TO INITIATE INSULIN THERAPY FOR TYPE 2 DIABETES PATIENTS IN PRIMARY HEALTH CARE CENTERS, JEDDAH 2018

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Abstract:

Background: diabetes considered as a big health problem in Saudi Arabia. Uncontrolled hyperglycemia among diabetic patients and Unwillingness of physicians to initiate insulin is an apparent issue. While the majority of those patients follow up with primary health care physicians as they are the first line for health care system, few numbers of patients reach their diabetes control. Little is known about the barriers facing physicians to initiate insulin therapy in patients with type 2 diabetes.

Subjects and methods: a cross sectional analytical study was done among a sample of 211 physicians working at primary health care Centers ,MOH ,Jeddah, during the period between 1st till 30 th October 2018 , using self-administered questionnaires about demographic data and reflecting barriers related to doctors ,system and patients.

Main results: the study results revealed that majority of study sample 84.8% agreed that barriers for insulin initiation to type 2 diabetic patients were barriers related to patients , while 13.8% of them disagreed about these barriers. As regard to barriers related to institution, 61.1% disagreed about it and only few numbers about 3.8% agreed. with a correlation related to age of physicians. About 63.5% of our sample were neutral to barriers related to physicians , while 14,2% agreed and 22,3,% disagreed to presence of barriers . Most of the barriers related to physicians affected by age and experience factors, with increasing age and experience there was less barriers

Conclusion: This study identified numerous barriers facing physicians to initiating insulin among type 2 diabetic patients in primary health care centers.it found that most of these barriers related to patients rather than doctors or institutional barriers .Patients related barriers as fear of side effects (hypoglycemia and / or weight gain) and patients education had the greatest percentage to their acceptance of insulin therapy and overcoming these barriers will require more education and councelling of patients with multidisplinary team in primary health care centers.

Key words: Diabetes, Insulin, Barriers, physicians, Saudi Arabia

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INTRODUCTION:

Diabetes mellitus is a major health problem in the world . According to international Diabetes federation, there are 425 million people with diabetes in the world .and in 2045 there will be 629 million with diabetes .KSA ranked to be first country in Asia in prevalence of diabetes (% of population ages 20 to 79). [1]

Type 2 diabetes is due to either insulin resistance or insulin secretion defect. with a lot of factors affecting it , mostly obesity and sedentary life style. Uncontrolled hyperglycemia increases risk for micro and macrovascular complications , which increases rate of mortality and morbidity. [2] Several trials, have shown that improving glycemic control via lifestyle modifications and the use of medications, reduces micro-vascular and possibly macro-vascular complications and mortality related to diabetes. However, over time, the progressive nature of beta cell dysfunction results in the inability of oral hypoglycemic agents to control hyperglycemia and achieve HbA1c targets [3-4] .This gradual loss in beta cell function would indicate that insulin therapy is almost always required at some point to treat diabetic patients [5] .With already high numbers of patients and a relatively small number of diabetes specialists worldwide, 90% of patients receive care for their diabetes from primary care physicians (PCPs) [6].

Although most PCPs believe that the initiation of insulin therapy is an essential component in the management of type 2 diabetes, many still consider it to be the "last option" and indicate that their patients are reluctant to accept this therapy. In the seminal Diabetes Attitudes, Wishes, and Needs (DAWN) study, Peyrot et al [7] reported that approximately 50% of healthcare professionals delay insulin initiation until it is "absolutely necessary.

Patients with type 2 diabetes do not commonly receive insulin on time [7-8].

This resistance to initiate insulin therapy at the appropriate time participates in the prolonged periods of poor glycemic control and raises the risk for neuropathic, microvascular, and macrovascular complications [9-10].
It is estimated that at least 50% of patients with type 2 diabetes may need insulin within 6 years diagnosis[11].   .

Initiating insulin therapy in the primary healthcare centers has some practical and theoretical barriers . patient-related barriers include a sense of personal

failure, a negative impact on social life, injection phobia, myths and misconceptions about the drug, the permanence of the therapy, difficulties in fulfilling responsibilities at home and at work, limited insulin self-management training, inadequate provider explanation about the risks and benefits of the intervention - and concerns over weight gain and hypoglycemia . Physicians' barriers as patient reluctance, language barriers, their concern for patients' comorbidities and their own lack of training . barriers related to system may include a lack of resources (e.g., staff and materials), a lack of continuity of care, as well as the workload and time constraints of PCPs [12].

There are several factors contribute in this resistance such as; "beliefs, perceptions regarding diabetes and its treatment and the nature and consequences of insulin therapy" [13]. Primary health care physicians are always the first destination for the majority of diabetic patients. Patients with type II diabetes come to the physicians to help them in addressing and managing their problems. However, only a few numbers of patients could reach diabetes control target [14]. Clarifying the role of the primary care physician in the management of diabetes is essential to reduce diabetes mellitus-related complications .

In 2015, Muharrem et al conducted a cross-sectional study using a self-administered survey among 87 family physicians working at 36 family health centers in urban Malatya to determine the factors associated with PHC physicians to delay initiation of insulin treatment in patients with type 2 diabetes. The results revealed that 42.5% (n = 37) felt unqualified to start dosage adjustment and 40.2% (n = 35) felt unqualified to maintaining the correct dosage adjustment. Regarding gender, female family physicians were more uncertain about the timing of initiating insulin treatment for diabetic patients. They concluded that there is need to provide more educational program and interventions to raise motivation in family physicians to improve their skills to take care of diabetic patients in primary care. **(15)**

In 2017, Ates et al conducted a multicenter, cross-sectional by using a questionnaire and face-to-face interviews to 446 PCCPs in Turkey during July 2015 and July 2016 to assess initiation of insulin status, insulin initiation barriers and knowledge levels about treatment administered by primary care physicians (PCP). It showed that 84 PCPs (19%) initiated insulin therapy in the past.while the main barrier is "lack of

clinical experience" . with poor level of knowledge. They recommended continues training program to increase the knowledge and skills. **(17)**

MATERIALS AND METHODS:

Analytical cross- sectional study was conducted during the period 1st till 31october 2018 at primary health care centers of MOH . This study targeted all Physicians working in Primary Health Care centers MOH , Jeddah , Saudi Arabia..Total number of physicians is 382 physicians among them (313 General practitioners and 69 Family physicians).

Sample size was calculated by using Raosoft calculator, with 95% of confidence interval, 5% error and prevalence of 50% . Sample size was 192 physicians and to compensate for non-responders 10% added , making 211 physicians as total sample size. The physicians selected by using Multistage stratified sampling technique . As all Primary health care centers in Jeddah already were divided into 5 strata (related to governmental hospitals) , from each stratum 6 centers were randomly selected by simple random sampling. All the physicians working in the clinics at these centers asked to voluntary participate in this study with Self-administered questionnaire distributed and recollected during duty hours, without any disturbance for patients and physicians. The questionnaire divided into two main parts. First part for socio-demographic & job characteristics, second part for Insulin initiation barriers which cover three main aspects of these barriers that related to doctors , patients and institute . The Inclusion criteria were all physicians who are working in PHCC, MOH in Jeddah city during the study period and excluded Physicians who are working in administration positions. The dependent variables were the the barriers for insulin initiation in type 2 diabetes among physicians in PHCC, MOH, Jeddah city while the Independent variable were Gender, age, Nationality, Specialty, job title, years of work and qualification .

Data was analyzed by using active incorporation of the statistical product and service solution (SPSS) version 21. Descriptive data were expressed as frequency and percentage. Qualitative data were expressed as mean and standard deviation. A comparison between variables carried out by using other statistical tests as Coefficient correlation test Level of significance at p<0.05, 0.001 were used as the cut of value for statistical significance.

Both the study protocol and questionnaire were approved by local research committee. Permission obtained from the joint program of family and community medicine and public health administration represented by the Department of Medical Research and Studies, Directorate of Health Affaires, Jeddah, Ministry of Health.
Written consent was obtained from all participants and all collected data were kept in confidentiality.

RESULTS:

Among 211 physicians (88,2%) of them were Saudi and (11.8 %) were non Saudi. their mean age was (30.85 ± 5.37) years.Nearly two thirds (69,2%) of the subject were female , while about one third of them (30,8%) were male {Table 1 } . General practitioners were (86.3%), specialists were (10 %) and the least percentage (3,8%) were consultants {Figure 1}. MBBS as qualification constituted nearly two thirds (78.7%) of the subjects' qualification followed by board certificate (14,7%) , diploma degree (4,7 %) and the least percentage (1,9 %) have master degree as their qualifications { Figure 2}.More than half of the sample (59.7%) have (0 - 5) years' experience, (8,2%) have (6 -10) years'experience while the rest have more than 10 years'experience . Majority of the participants physicians (84.8%) agreed that barriers for insulin initiation to type 2 diabetic patients were related to patients , while (13.8%) of them disagreed about these barriers .More than half of them (61.1%) have disagreed about institutional barrier. As regard to doctor's barriers more than half (63.5%) of them were neutral, while (14,2%) have agreed and (22,3,%) have disagreed to presence of barriers.{Table 2} .

Regarding barriers facing physicians to initiation insulin therapy that related to patients, more than half (61.2%, 65.4% and 63.0% respectively) of the subject have agreed about for most of my patients, education is the key to the initiation of insulin, for most of my patients, the fear of side effects (hypoglycemia and/or weight gain) is the greatest barrier to their acceptance of insulin therapy and for most of my patients, the injection route of administration is the greatest barrier to their acceptance of insulin therapy respectively. While (46.4%) of participants agreed that Patients social background is a barrier to start insulin ,(45.0 %) agreed for Lack of family support is a barrier to start insulin. And (43,1%) agreed for Patients who are not compliant on oral medication or life style will not be compliant on insulin {Table 3}.

According to barriers related to doctors more than half of the sample (58.7% , 57.8% and 62.1% respectively) disagree about I do not have enough knowledge to start insulin, I am afraid to start insulin because I do not

know how to determine the dose and I am afraid to start insulin because it might cause hypoglycemia respectively also illustrated that more than two third (82.5%,71,1% ,80,6% and 75,8% respectively) of doctors disagree about I think insulin has no benefit in poorly controlled DM, The risk of weight gain associated with insulin therapy makes me reluctant to prescribe it, If complication of DM already established, no benefit from starting insulin and Fear of medico legal problems in case any side effect occurs due to initiation of insulin respectively.And (23.7 % , 30.3% , 22.2%) less than one third of the subject agreed that The initiation of insulin is one of the most difficult aspects of managing my patients with type 2 diabetes, I have knowledge but I lack training to start insulin and Different type of insulin is considered barrier respectively{Table 4 }.

For third part of the study regard to barriers related to institution Percentage Distribution of the Subject related to Institutional Barriers,the study showed that more than half of the subject (52.1%, 51.2% and 55.4% respectively) disagreed about excessive

workload -on me- is a barrier to start insulin, Short consultation time is a barrier to start insulin and lack on insulin consider as a barrier respectively. Among the physicians (37.4%) were neutral for Too few diabetic educators is a barrier to start insulin while 27.5% agreed it and for Lack of continuity of care is a barrier to start insulin nearly one third (37.4%)were neutral and (21.8%) agreed about it. Also appeared that about Lack of more knowledgeable staff I can ask regarding initiation of insulin is a barrier to start insulin (41.2%) disagreed ,(33.2%) neutral and one quarter (25.6%) agreed{Table 5 }.

For the Correlation between total barriers and baseline characteristics there was correlation between doctor barriers and subject age and experience, with increasing age and experience there was less barriers. And for total institutional barriers with increasing age there was less barriers while there was no correlation between institutional barriers and subjects' experience , sex and level . It also showed that there was no correlation between patients' barriers and subjects' age, experience, sex and level{Table 6 }

Table (1): Percentage Distribution of Baseline Characteristics of the Subject

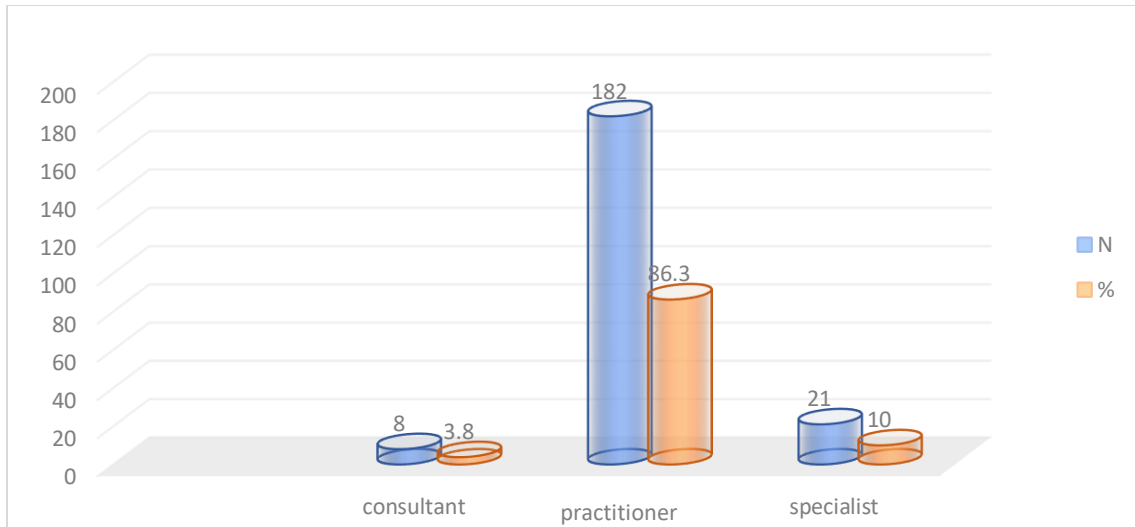| Items	N	%
Age:		
- 22- <33	136	64.5
- 33- <43	68	32.2
- ≥43	7	3.3
Mean ± SD	30.85 ± 5.37	
Nationality:		
- Saudi	186	88.2
- Non-Saudi	25	11.8
Years in Practice:		
- 0 to 5 years	126	59.7
- 6 to 10 years	59	28.0
- 11 to 15 years	15	7.1
- 16 years or more	11	5.2
Sex:		
- male	65	30.8
- female	146	69.2

Figure (1): Distribution of the subject according to their Level
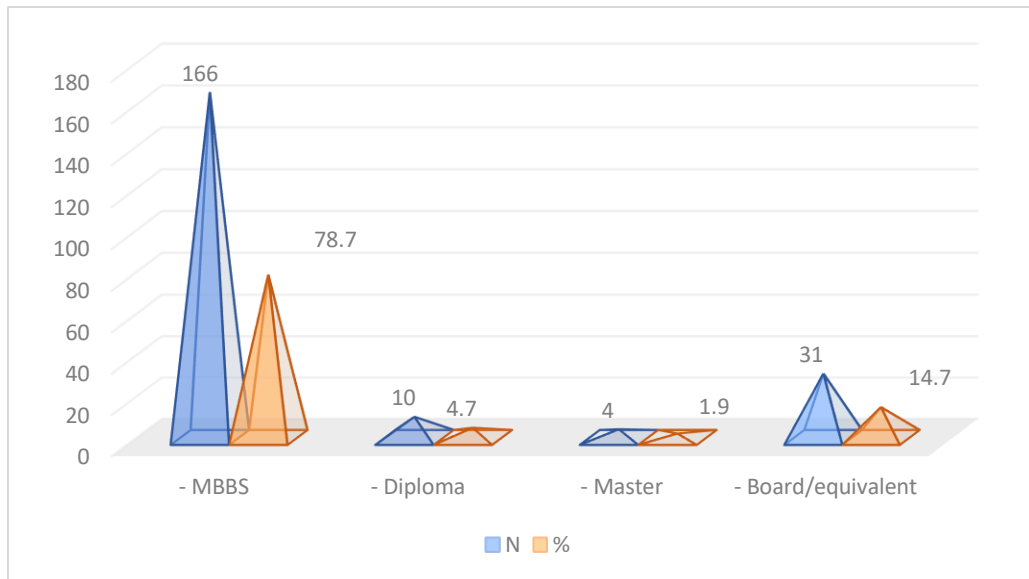
Figure (2): Distribution of the subject according to their Qualification

Table (2): Distribution of the subject according to their total Barriers

Items		Patient Barriers		Institutional Barriers		Doctor Barriers	
		N	**%**	**N**	**%**	**N**	**%**
Agree		179	84.8	8	3.8	30	14.2
Neutral		3	1.4	74	35.1	134	63.5
Disagree		29	13.8	129	61.1	47	22.3

Table (3): Percentage Distribution of the Subject related to Patients Barrier

Items	Agree		Neutral		Disagree	
	N	%	N	%	N	%
Patients education level is a barrier to start insulin	92	43.6	67	31.8	52	24.6
Patients social background is a barrier to start insulin	98	46.4	72	34.2	41	19.4
For most of my patients, education is the key to the initiation of insulin	129	61.2	56	26.5	26	12.3
Patients who are not compliant on oral medication or life style will not be compliant on insulin	91	43.1	80	37.9	40	19.0
For most of my patients, the fear of side effects (hypoglycemia and / or weight gain) is the greatest barrier to their acceptance of insulin therapy	138	65.4	49	23.2	24	11.4
For most of my patients, the injection route of administration is the greatest barrier to their acceptance of insulin therapy	133	63.0	57	27.0	19	9.0
Training in the proper administration and usage of insulin is too complicated for most patients	92	43.6	76	36.0	43	20.4
Patients resist & are unwilling to start insulin because they are shy to inject insulin in front of others	77	36.5	95	45.0	39	18.5
Having irregular meals is a barrier to start insulin	88	41.7	76	36.0	47	22.3
Inability to refrigerate insulin is a barrier to start insulin	87	41.3	60	28.4	64	30.3
Lack of transport to hospital in case of emergency is a barrier to start insulin	76	36.0	74	35.1	61	28.9
Lack of family support is a barrier to start insulin	95	45.0	72	34.1	44	20.9
Poor vision is a barrier to start insulin	99	46.9	78	37/0	34	16.1
Lipodystrophy at injection sites	103	48.8	62	29.4	46	21.8

Table (4): Percentage Distribution of the Subject related to Doctors Barrier

Items	Agree		Neutral		Disagree	
	N	%	N	%	N	%
I do not have enough knowledge to start insulin	24	11.4	63	29.9	124	58.7
I have knowledge but I lack training to start insulin	64	30.3	57	27.0	90	42.7
The initiation of insulin is one of the most difficult aspects of managing my patients with type 2 diabetes	50	23.7	72	34.1	89	42.2
I am afraid to start insulin because I do not know how to determine the dose	37	17.6	52	24.6	122	57.8
I think insulin has no benefit in poorly controlled DM	16	7.5	21	10.0	174	82.5
The risk of weight gain associated with insulin therapy makes me reluctant to prescribe it.	16	7.6	45	21.3	150	71.1
I am afraid to start insulin because it might cause hypoglycemia	24	11.4	56	26.5	131	62.1
If complication of DM already established, no benefit from starting insulin	14	6.6	27	12.8	170	80.6
Fear of medico legal problems in case any side effect occurs due to initiation of insulin	15	7.1	36	17.1	160	75.8
Different type of insulin	47	22.2	67	31.8	97	46.0

Table (5): Percentage Distribution of the Subject related to Institutional Barriers

Items	Agree		Neutral		Disagree	
	N	%	N	%	N	%
Excessive workload -on me- is a barrier to start insulin	35	16.6	66	31.3	110	52.1
Short consultation time is a barrier to start insulin	49	23.6	53	25.1	108	51.2
Lack of continuity of care is a barrier to start insulin	46	21.8	79	37.4	86	40.8
Too few diabetic educators is a barrier to start insulin	58	27.5	79	37.4	74	35.1
Lack of more knowledgeable staff I can ask regarding initiation of insulin is a barrier to start insulin	54	25.6	70	33.2	87	41.2
Lack of Insulin.	39	18.5	55	26.1	117	55.4

Table (6): Correlation between Total barriers and Baseline Characteristics

Items	Age		Experience		Sex		level	
	r	P	r	P	r	P	r	P
Total doctor related barriers	.341	<0.001	.229	<0.001	.103	0.>005	.042	0.>005
Total institution related barriers	.186	<0.001	.080	0.>005	.004	0.>005	.067	0.>005
Total Patient related barriers	.011	0.>005	.019	0.>005	.089	0.>005	.045	0.>005

DISSCUSSION AND CONCLUSION:

Insulin therapy is the most effective means of controlling glucose levels in patients with diabetes, and insulin should be used from an early stage if necessary .

To the best of our knowledge, the present study is one of few quantitative researchs work that has explored barriers facing physicians to initiate insulin therapy for type 2 diabetes patients in primary health care centers. As regard to doctor barriers:

The present study revealed that more than half 58.7% & 42.7% of physicians disagree about I do not have enough knowledge to start insulin and I have knowledge but I lack training to start insulin. Clearly, the knowledge, training and experience of the physician are an important factor, and must affect patient management in more domains than just insulin initiation [17]. This factor may also overlap with an over-concern (by the PCP) about their patient's ability to cope with injections or about possible patient side-effects such as weight-gain and hypoglycemia [18-19-20-21]. Similarly, a 2007 study conducted in the United Kingdom to partially evaluate a training course

for insulin initiation found that most of the healthcare providers thought that the course was useful and made them more confident in dealing with diabetic patients [22]. The focused training and exposure to diabetic patients during 29

postgraduate education seemed to improve knowledge and helped to change attitudes [23] .

As regard the initiation of insulin is one of the most difficult aspects of managing my patients with type 2 diabetes 42.2% of physician disagree about this point. This may be due to Physicians assess their insulin-requiring diabetic patients in ways different to their specialist colleagues - considering patients adherence and motivation (as well as general health status, HbA1C and blood glucose levels) thus delaying insulin initiation. Half of the participants of a study done by Haque et al identified a gap in knowledge and training on the initiation of insulin therapy. [24]This indicates lack of knowledge regarding many aspects of diabetes in general and insulin therapy in particular. The need for more teaching and continuing medical education is essential. In fact, we may need to go back to medical schools' curriculums and make changes; medical students should be given more time to study

diabetes and its management. Interns and residents should be exposed to more out patients diabetes management.

Hayes et al [26] explored the attitudes of 505 PCPs in the United States regarding initiation of insulin reported that initiation of insulin is the most difficult part of managing type 2 diabetes, due to the need for injections. 30 As regard insulin has no benefit in poorly controlled DM & If complication of DM already established, no benefit from starting insulin 82.5% & 80.6% disagree this may be due to the physicians more knowledgeable about insulin therapy and about the benefits of insulin therapy. 62.1% of physician disagrees about afraid to start insulin because it might cause hypoglycemia. Hypoglycemic symptoms are still a major barrier to achieving adequate glycemic control, for both patients and physicians. Concern about hypoglycemic symptoms was also a major barrier to the initiation of insulin therapy at an appropriate time .

As regard institution barriers :
Too few diabetic educators, Lack of continuity of care and Short consultation time were the most important institutional related barriers according to our study participants. 23.6% , 21.8 & 27.5% respectively agreed that the lack of diabetic educators, lack of continuity of care and short consultation time were a barrier to initiate insulin. Measures should be taken to make full use of the available diabetic educators, enhancing the appointment system for diabetic educators. Arranging for group education or public lectures or increasing number of available diabetic educators. Actions should be implemented to arrange booking system to ensure the continuity of care. We also find that general practitioners agreed more on the lack of time than other groups of doctors, which maybe because they lack experience or because they wanted to be comprehensive in one consultation. 40% of the participants of a study done by Hayes et al [26] agreed or strongly agreed that training of their patients is too time-consuming for their staff. Also, lack of continuity of care and time constraints were common barriers for initiating insulin according to the same study by Haque et al.[25]

As regard Patients barriers:
Participants of our study agreed on most of the patients related barriers. While 43.6% and 46.4 respectively of our participants agreed on the fact that patients' education level and social background are barriers to initiate insulin therapy, Haque et al found that there was a strong perception that poor socio-economic

conditions impeded patients' compliance with treatment.[25] However, in a UK study,[27] glycaemic control was not related to age, social class, lifestyle, attitude, or knowledge of patients but rather to better facilities, mini-clinics, and doctors with special interest in diabetes. More than half of our study participants agreed on the fact that patients' education is the key to the initiation of insulin. Nearly all participants of the study done by Hayes et al [26]agreed that for most patients, education is the key to insulin initiation. However, Brunton et al [28] pointed out that this education is usually given when diabetes has progressed to the point that insulin is the only alternative for glucose control. They further stressed the importance of educating the patient at diagnosis about the progression of diabetes and the inevitability of needing insulin to maintain good glycaemic control, rather than using insulin as a threat to motivate patients.[28] There should be plans to educate diabetic patient and their families early in the disease course by various means of lectures, activities, leaflets or by public media like newspapers and television.

Nearly 60% of our study participants agreed that the injection route of insulin administration is the greatest barrier to patients' acceptance of insulin therapy, Similar to the finding of the study of Hayes et al [26]where most of their participants agreed on this barrier. However, studies are conducted to produce insulin which can be used by other routes than injection like inhaled insulin [29] which can remove an important barrier for initiating insulin therapy for diabetic patients.

Limitation of the study:
Few discussion references due to little national and international researches studied this topic. Most of the researches were qualitative researches.

In conclusion , This study identified numerous barriers facing physicians to initiating insulin among type 2 diabetic patients in primary health care centers.it found that most of these barriers related to patients rather than doctors or institutional barriers .

Patients related barriers as fear of side effects (hypoglycemia and ∕ or weight gain) and patients education had the greatest percentage to their acceptance of insulin therapy and overcoming these barriers will require more education and councelling of patients with multidisplinary team in primary health care centers . As well as physicians education is also indicated.

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