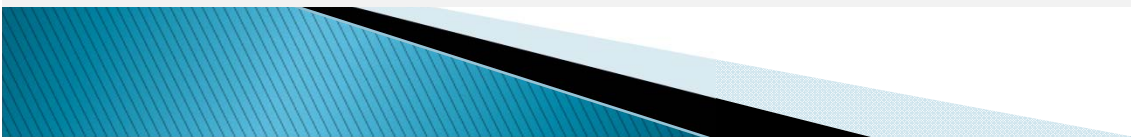


**Common Skin Problems Among Diabetic
Patients & Its Relation with Targeted
HbA1C Achievement:
A Preliminary Study in Selected Public
Primary Care Clinic in Kuantan, Malaysia**

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Introduction: DM & Skin Problems

- ▶ **In Malaysia, the prevalence of diabetes drastically increased in from 14.9% in 2006 to 22.9% in 2013 had been reported**
 - ▶ **Only 22 % of them achieved treatment target of HbA1C < 7% .**
 - ▶ **Diabetes if not controlled predisposes the skin to multiple infections as well as increases the possibility of developing neurovascular and other systemic complications which can give rise to various dermatological manifestation.**
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Introduction: DM & Skin Problems

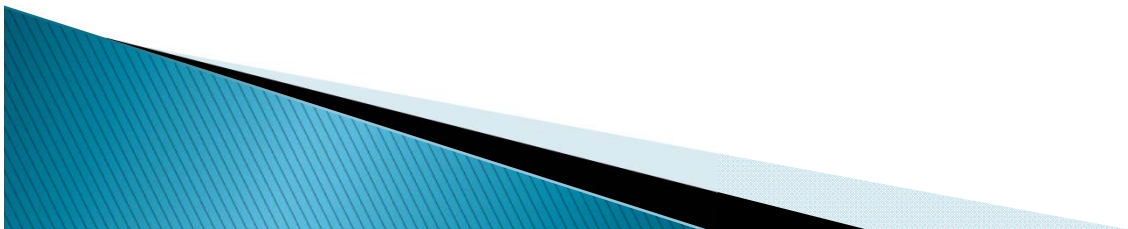
- ▶ **Overall prevalence of skin problems in both type-1 and 2-DM varied from 51.1% to 97% in different regions worldwide.**
- ▶ **However, skin problems, usually neglected and frequently underdiagnosed among diabetic patients which can lead to major complications and revolve around multifactorial factors besides hyperglycaemia and advanced glycation end products (Geisa Maria et al, 2016).**
- ▶ **A significant association of unsatisfactory glycemic control with bacterial infection and fungal infection among Pakistan type-2 DM patients was published in Furquana N et al study (2016).**

Introduction: Rationale & Justification


- ▶ **Nevertheless, controversial finding was found out in one recently publication that skin infections were seen more among Indian DM patients with poor glycemic control as compared to those with good glycemic control though a significant relationship between glycemic control and the prevalence of skin infections could not be obtained (Girisha B S et al study, 2017).**
- ▶ **Besides, evidences regarding existence of skin problems among Malaysian T2DM patients and its relation with their glycemic control status have not been found out yet in the literature.**

Aim

To investigate existence of common skin problems among Malaysian T2DM patients from a public primary care clinic and its relation with their targeted HbA1C \leq 6.5% achievement



Specific Objectives

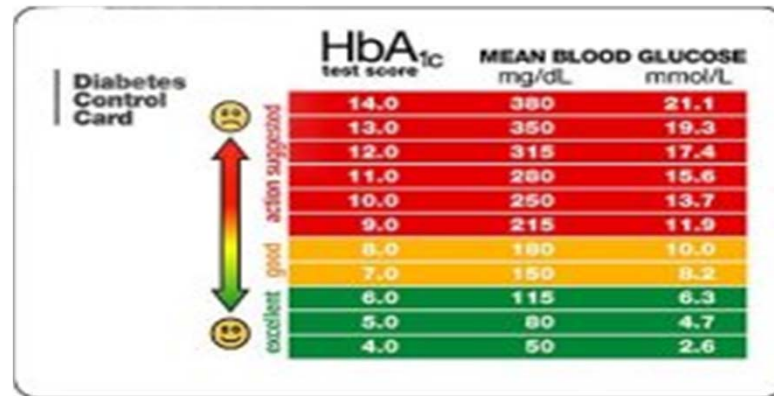
- ▶ **1. To identify demographic and bio-clinical background of Malaysian T2DM patients from a public primary care clinic**
 - ▶ **2. To assess targeted $\text{HbA1C} \leq 6.5\%$ of Malaysian T2DM patients from the public primary care clinic**
 - ▶ **3. To assess existence of skin problems of Malaysian T2DM by clinical examination using Pictorial chart of DM skin problems**
 - ▶ **4. To find out association between existence of skin problems and its relation with targeted $\text{HbA1C} \leq 6.5\%$ of Malaysian T2DM patients**
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Methods

- ✚ **Design** : A cross-sectional descriptive and analytical study
- ✚ **Sample size** : 63 T2DM patients from a public primary care clinic, Klinik Kasihatan Jaya Gading, Kuantan, Pahang state, Malaysia
(Prevalence of skin problems among DM patients (37%), (Reference- Girisha B S et al, 2017) ,Significant level $\alpha = 0.05$ & power of the test $(1-\beta) = 80\%$)
- ✚ **Sampling & Sampling Unit:**
- ✚ **Inclusion Criteria** : All DM patients aged between **18-65** years old, Both Gender, All races , **actively taking DM treatment for at least one year**
- ✚ **Exclusion Criteria** : Type-1 DM patients, gestational diabetes patients; DM patients with known DM complications & immunosuppressive status

Methods

- ▶ **Data Collection:** A *pre-tested questionnaire* (Background demographic and clinical data, duration and types of DM medication (oral hypoglycaemic agent, insulin injection and both))
- ▶ **Checklists:** Clinical examination & using a pictorial chart (existence of skin problems) ; Fasting/Random blood glucose level on the day of data collection & HbA1C % (within 6 months duration)
- ▶ **Data Analysis :** **HbA1C \leq 6.5%** (*Glycemic control achievement-Cut-off point*) .
- ▶ **Descriptive analysis :** Frequency (%) , Descriptive summary statistics in terms of minimum, maximum, mean (SD)
- ▶ **Inferential analysis :** **X^2 test and simple linear correlation** were used to infer relationship between existence of skin problems and targeted HbA1C \leq 6.5% achievement of T2DM patients.



Findings



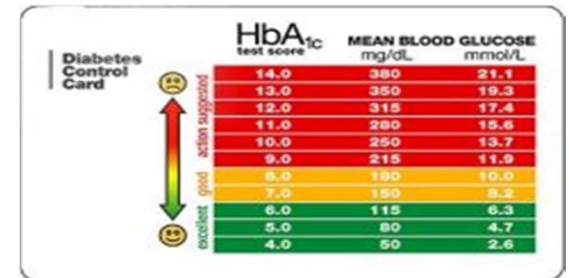
Demographic Background

Demographic background	No	%
<u>Age group</u>		
≤ 40 years	3	4.8
40-60 years	31	49.2
>60 years	29	46.0
Mini=31 years Maxi= 79 years Mean (SD) = 58.24 (9.9)years		
<u>Gender</u>		
Male	19	30.2
Female	44	69.8
<u>Race</u>		
Malay	60	95.2
Chinese	2	3.2
India	1	1.6

DM Clinical Background

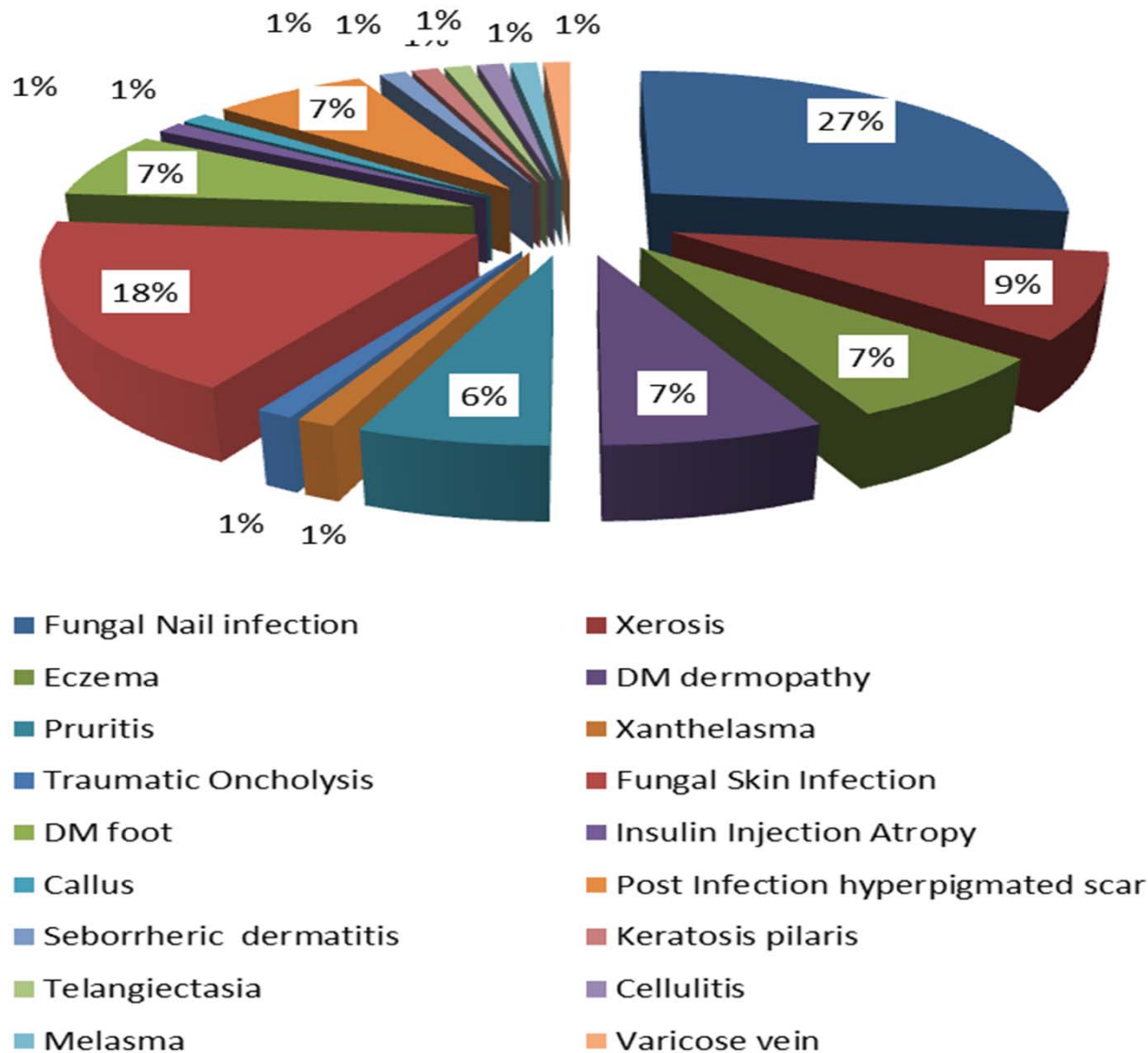
DM Clinical background	No	%
<u>DM duration in year (n=61)</u>		
≤ 5 years	35	57.4
>5-10 years	10	16.4
>10 years	16	26.2
Minimum-<1 year Maximum-27yearsMean (SD) =6.7 (6.6)years		
<u>DM Medication</u>		
Oral Hypoglycaemic agent (OHA)	44	69.8
Both OHA and Insulin Injection	19	30.2

Glycemic Control Status

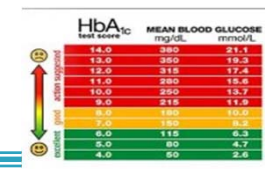


Glycemic Control Status	No	%
<u>Targeted HbA1C achievement</u>		
Controlled ($\leq 6.5\%$)	17	27
Uncontrolled ($>6.5\%$)	46	73
Mini-5.1% Maxi-16.1% Mean (SD) = 8.33(2.5) %		
<u>Fasting Blood Glucose Level (mmol/l) (n=23)</u>		
Controlled (≤ 7 mmol/l)	7	30.4
Uncontrolled (> 7 mmol/l)	16	69.6
Mini-4.6, Maxi-14.5, Mean (SD) = 7.6(2.9) mmol/l		
<u>Random Blood Glucose Level (mmol/l) (n=40)</u>		
Controlled (≤ 11.1 mmol/l)	11	27.5
Uncontrolled (>11.1 mmol/l)	29	72.5
Mini-4.9% , Maxi-17.4, Mean (SD) = 9(2.7) mmol/l		

Distribution of skin problems among T2DM patients under the study (n=82)



Association between targeted HbA1C ≤6.5% Achievement & Number of Skin Problems of T2DM patients (n=63)

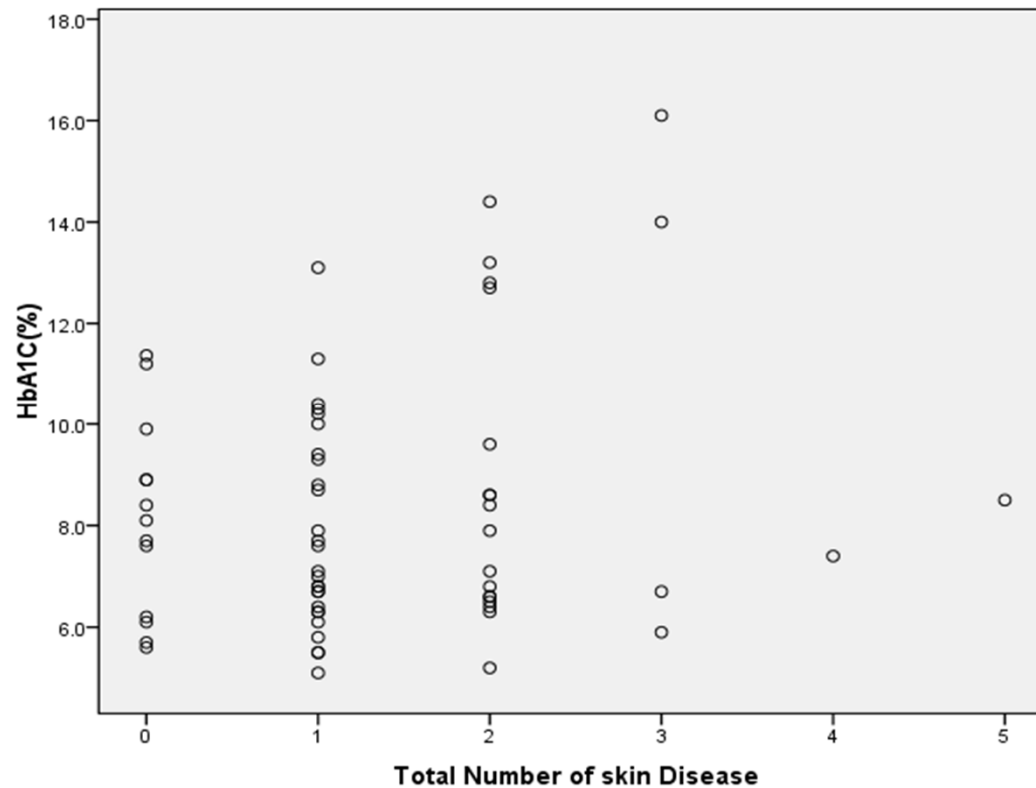


Number of skin problems	Targeted HbA1C ≤6.5% achievement		Total n (%)
	Controlled ≤6.5% n (%)	Uncontrolled >6.5% n (%)	
No skin problem	4 (30.8)	9 (69.2)	13 (20.6)
One skin problem	8 (29.6)	19 (70.4)	27 (42.9)
Two skin problems	4 (23.5)	13 (76.5)	17 (27%)
Three skin problems	1 (25)	3 (75)	4 (6.3)
Four skin problems	0 (0)	1 (100)	1 (1.6)
Five skin problems	0 (0)	1 (100)	1 (1.6)
Total	17 (27)	46 (73)	63 (100)

$\chi^2 = 1.041$, $p = 0.969$ (Fisher's exact test)

Correlation Between Total Number of Skin Problems & HbA1C% of T2 DM patients(n=63)

HbA _{1c} test score	MEAN BLOOD GLUCOSE mg/dL	mmol/L
14.0	380	21.1
13.0	350	19.3
12.0	315	17.4
11.0	280	15.6
10.0	250	13.7
9.0	215	11.9
8.0	180	10.0
7.0	150	8.2
6.0	115	6.3
5.0	80	4.7
4.0	50	2.6

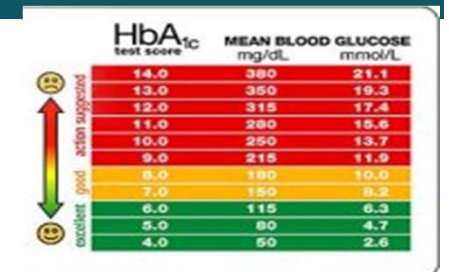


Pearson Correlation = 0.16
Significant "p" (2- tailed) = 0.22

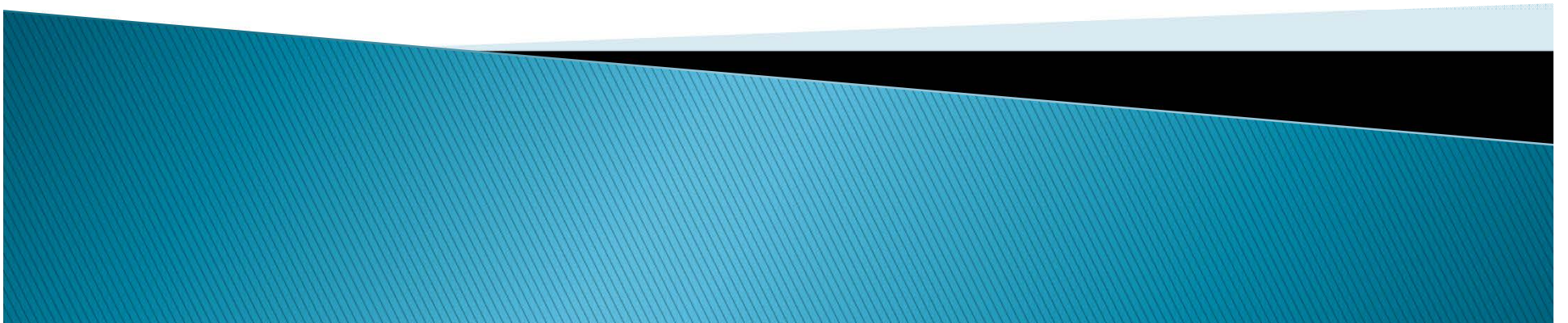
Association Between Targeted HbA1C ≤6.5% achievement and existence of skin problems among the T2DM patients (n=63)

Number of Skin problems	Targeted HbA1C ≤6.5% achievement		Total n (%)
	Controlled ≤6.5% n (%)	Uncontrolled >6.5% n (%)	
No skin problem	4 (30.8)	9 (69.2)	13 (20.6)
One or more skin problems (+)	13 (26)	37 (74)	50 (79.4)
Total	17 (27)	46 (73)	63 (100)

$\chi^2 = 0.119$, $p = 0.735$ (Fisher's exact test)



Discussion & Conclusion



Discussion & Conclusion:

Prevalence of Skin Problems Among T2DM patients

- ▶ Prevalence of skin problems among T2DM patients (79.4%) > Malaysian general population (51.9%) (*Ghaneshwari R et al, 2015*)
- ▶ Overall prevalence of skin disorder in both type-1 and type-2 DM varied from 51.1% to 97% in different regions : Brazil (89.1%) & Argentina (90.4%) (*Ref :Geisa Maria (2016)*)
- ▶ Thus, not only **variations of prevalence of the skin problems prevalence within the same race** -Malaysian general population and Malaysian T2DM patients but also **Geographical variations of skin problems** within the DM patients are clearly notified.

Discussion & Conclusion:

“Common Skin Problems Among T2DM patients”

The most common skin problems are more or less same with others studies:

- ▶ **Bacterial infections, Fungal infections, parasitic infection**
- ▶ **Xeroderma, onychomycosis,**
- ▶ **Peripheral hypotrichia, Diabetic dermopathy,**
- ▶ **skin thickening syndrome,**
- ▶ **Diabetic foot,**
- ▶ **Fibroids pendulums, Intertrigo,**

(Ref:Ghaneshwari R et al ,2015 &Geisa Maria, 2016)

Discussion & Conclusion: Role of Primary Care Physicians

- ▶ The **high prevalence of skin problems among DM** patients described in literature endorses the clinical importance and high impact of this complication on the patients' quality of life.
- ▶ **Careful dermatological examination and outpatient follow-up of DM patients** is required to provide adequate skin management to them for reduction morbidity and complications related to skin.
- ▶ Thus, role of primary care physicians are crucial for DM patients with skin problems to prevent further complications **by providing quick diagnosis & immediate treatment** of the severe complications or even fatal outcome is to be averted.

Discussion & Conclusion: Relations between Skin Problems & Glycemic Control

- ▶ **Controversial results ? ??**
- ▶ In Furquana N et al study in Pakistan type-2 DM patients (2016): A significant association of unsatisfactory glycemic control with bacterial infection and fungal infection among
- ▶ Girisha B S et al in India (2017) & the present study in Malaysia : No significant association between existence of skin problems and targeted HbA1C \leq 6.5% achievement
- ▶ **Due to Research design, sampling methods, indicators and cut-off level of glycemic control & type of diabetes used for comparison , different races/geographical variations**

Recommendation

High prevalence of skin problems among T2DM patients highlighted→

- ▶ To promote both **skin care education among diabetic patients & primary care dermatology training for the medical doctors** who are working at the public primary care clinics in Malaysia.
- ▶ Further studies on association between Skin problems & glycemic control status of T2DM patients should be conducted with precise research methodology in high DM prevalence regions for **local application and to add in data bank for further review and meta-analysis.**



Thank You