OPEN ACCESS ORIGNAL ARTICLE

FREQUENCY AND CLINICAL SPECTRUM OF DIABETIC DERMOPATHY IN A TERTIARY CARE HOSPITAL: A DESCRIPTIVE STUDY.

Safdar Ali Parveez Tunio[1], Areeba Botal[2], Laila Aijaz[3], Ghulam Muhammad Phull[4], Abdul Ghani Rahimoon[5], Atif Ahmed[6]

ABSTRACT:

BACKGROUND: The most frequent cutaneous manifestation of diabetes mellitus is diabetic dermopathy, usually found as asymptomatic brown macules on the shins. Though it is frequent, local information on its frequency and clinical spectrum in Pakistan is scarce. **OBJECTIVE:** To find the frequency and outline the clinical spectrum of diabetic dermopathy among patients with diabetes mellitus in a tertiary care hospital. **METHODS:** This was a descriptive cross-sectional study at the Dermatology and Medical Departments, Peoples Medical College Hospital (PMCH), Nawabshah, spanning six months. 385 consecutive diabetes mellitus patients were enrolled using non-probability consecutive sampling after informed consent. In-depth history, dermatological examination, and documentation of diabetic dermopathy (lesion features, number, location, symptoms) were obtained. **RESULTS:** In 385 patients (mean age 54.6 ± 10.8 years; 56% women), the prevalence of diabetic dermopathy was 34.8% (n=134). Most lesions were brownish macules on the anterior shins that were asymptomatic (89%), with 65% being bilateral. The number of lesions per patient varied from 2 to 12 (mean 5.1 ± 2.3). The incidence of dermopathy was more in the poorly controlled glycemic group (HbA1c >8%; $p<0.05$). There was no gender predilection. Forearms (7%) and thighs (4%) were other affected areas. 12% of dermopathy cases presented with pruritus. **CONCLUSION:** Diabetic dermopathy occurred in more than one-third of diabetes mellitus patients in our tertiary healthcare center, with the most prevalent presentation being asymptomatic brown macules on the shins. Routine dermatologic checks in diabetic patients help in the early recognition of dermopathy as a clinical marker of microangiopathic complications and disturbed glycemic control.

KEYWORDS: Diabetic dermopathy, diabetes mellitus, cutaneous manifestations, frequency, Pakistan

1. Associate Professor, Medicine, KMC.
2. House Officer PUMHSW, SBA.
3. Consultant NAWABSHAH.
4. Associate Professor of Physiology, Gambat Medical College, Gambat.
5. Associate Professor LUMHS, JAMSHORO.
6. Assistant Professor, of Medicine, Bilawal Medical College for Boys Jamshoro LUMHS

Corresponding Author: Safdar Ali Parveez Tunio, Associate Professor, Medicine, KMC. Email: sufee1981@gmail.com

How to Cite This Article: Tunio SAP[1], Botal A[2], Aijaz L[3], Phull GM[4], Rahimoon AG[5], Ahmed A[6] **FREQUENCY AND CLINICAL SPECTRUM OF DIABETIC DERMOPATHY IN A TERTIARY CARE HOSPITAL: A DESCRIPTIVE STUDY.** J Peop Univ Med Health Sci. 2025:15(2),168-174. http://doi.org/10.46536/jpumhs/2025/15.02.637

Received on 13 APRIL 2025, Accepted On 30 JUNE 2025, Published On 30 JUNE 2025.

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder of long duration that is characterized by hyperglycemia due to defects in insulin secretion, insulin action, or both[1]. Diabetes is spreading at a fast pace globally, and in 2021, 537 million adults had diabetes, which will increase to 643 million by 2030[2]. In Pakistan, the burden is also great, with a national prevalence estimated at about 17%, which

creates a huge burden on the healthcare system[3].

Cutaneous manifestations are frequent in diabetic patients and have been reported in 30–80% of patients and are usually manifestations of systemic disease manifesting as visible markers[4]. Diabetic dermopathy is the most common cutaneous manifestation in DM, seen as asymptomatic, atrophic, hyperpigmented macules on the anterior shins[5]. Initially described by Melin and Good in 1964, DD is frequently known as "shin spots" and is regarded as a cutaneous marker of diabetic microangiopathy[6].

The etiology of DD is unclear but is believed to be due to microangiopathic changes induced by trauma, deposition of hemosiderin, and dermal fibrosis[7]. Histopathologic examination tends to show dermal fibrosis, hemosiderin deposition, and the thickening of capillary basement membranes, as in diabetic microvascular changes of complications[8]. Non-enzymatic protein glycation due to chronic hyperglycemia leads to microangiopathy and impaired wound healing, which can contribute to the persistence of DD lesions[9].

The presence of DD has been correlated with unstable glycemic control, long duration of diabetes, and microvascular diabetes complications, such as diabetic retinopathy, nephropathy, and neuropathy[10]. An Indian study presented that DD was more common in diabetes of over 10 years' duration, emphasizing the relationship between long-standing hyperglycemia and cutaneous microvascular alterations[11]. Likewise, recent local Pakistani studies have shown that DD can be a marker of poor glycemic control and diabetic complications and stressed its identification in clinical evaluations[12,13].

The incidence of DD is also heterogeneous among populations with rates ranging from 7% to 70% among diabetic individuals[4,14]. In Lahore, a study reported an incidence of 36% among diabetic patients, consistent with neighboring countries' data[12]. Globally, Indian and Kuwaiti studies have shown varying rates between 33% and 42%[11,15], with reasons including population demographics, control of blood sugar, and access to health services.

Although it has clinical relevance, DD is generally underdiagnosed as the lesions are usually asymptomatic and patients seldom report them for medical care[10]. Nevertheless, the presence of DD is a welcome window of opportunity for clinicians to spot individuals at increased risk for systemic complications so that timely interventions can be made, especially in resource-poor environments such as Pakistan, where sophisticated screening devices may not be readily available[3].

With the growing burden of diabetes in Pakistan and the possible role of DD as a clinical indicator for microvascular complications, there is a need to establish local data to aid early detection and intervention program in diabetic care. The current research aims to establish the frequency and spectrum of diabetic dermopathy in patients with diabetes mellitus presenting in a tertiary care hospital in Nawabshah, Pakistan, which adds to its local clinical practice and epidemiology.

METHODS

Study Design and Setting: The descriptive cross-sectional study was performed at the Department of Medicine and Dermatology Peoples Medical College Hospital (PMCH), Nawabshah, a Sindh-based tertiary care teaching hospital in Pakistan, between January 2024 and June 2024.

Study Population: 385 diabetic mellitus patients visiting the outpatient departments of medicine and Dermatology between January 2024 and June 2024 were recruited through non-probability consecutive sampling.

Inclusion Criteria: ≥18-year-old patients with confirmed diabetes mellitus, patients

who are willing to participate and give informed consent.

Exclusion Criteria: Patients with secondary causes of pigmented pretibial lesions (e.g., stasis dermatitis, lichen planus, pigmented purpuric dermatoses), patients taking hyperpigmentation medications (e.g., antimalarials) and patients with coagulopathies or peripheral arterial disease.

Ethical Considerations: The research was carried out after seeking the Institutional Review Board of Peoples University of Medical and Health Sciences, Nawabshah, approval. Informed written consent was achieved from all the participants with the guarantee of confidentiality and the right to withdraw from the study at any point without compromising their care.

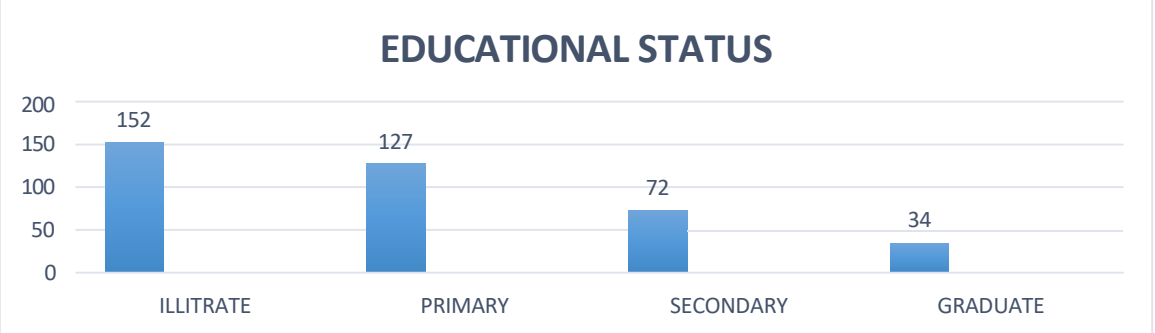
Data Collection: A standardized proforma documented age, gender, occupation, and domicile. Diabetes-specific information encompassed type, duration, treatment, and current HbA1c. Cutaneous inspection in daylight centered on pretibial regions for diabetic dermopathy, with documentation of the number, size, shape, color, laterality, symptoms, and other sites affected. Diabetic complications were also evaluated through fundoscopy for retinopathy, serum creatinine and urinary albumin for nephropathy, and clinical examinations for neuropathy to determine correlations with dermopathy.

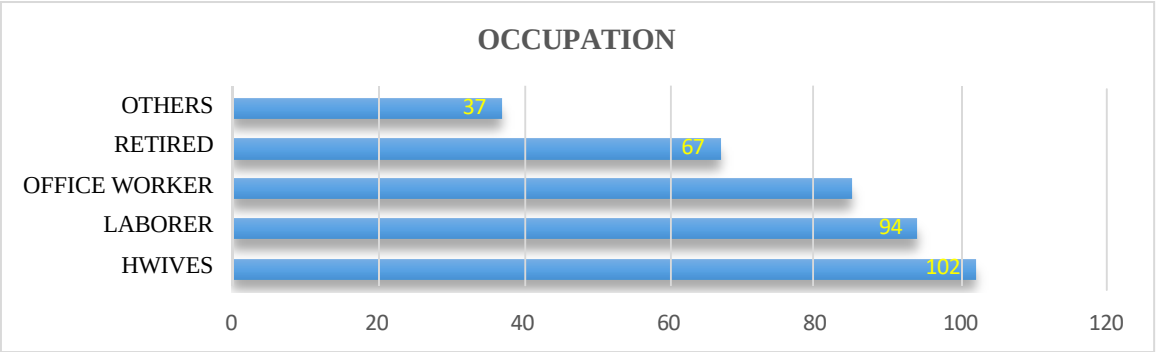
Data Analysis: Data were entered and analyzed on SPSS version 26. Continuous variables (age, diabetes duration, HbA1c) were presented as mean ± standard deviation (SD). Categorical variables (gender, dermopathy presence, type of diabetes, complication presence) were presented as frequency and percentages. The diabetic dermopathy frequency was determined as proportion of patients with clinically diagnosed dermopathy out of the total participants. Correlations of the occurrence of dermopathy with variables like age, sex, type of diabetes, duration of diabetes, level of HbA1c, and diabetic complications were compared using the Chi-square test for dichotomous variables and Independent Samples t-test for quantitative variables. It was decided that a p-value of <0.05 would be considered significant.

Quality Control Measures: All clinical evaluations were carried out by two experienced dermatologists to allow for consistency in diagnosis. Cross-verifications of entry of data were done on a regular basis to reduce errors. Calibration sessions were organized prior to data collection to provide consistency in measurement and documentation of lesions.

RESULTS

There were a total of 385 diabetic mellitus patients included in this research. The participants' mean age was 54.6 ± 10.8 years (age range: 28–78 years). Based on gender distribution, there were 216 (56.1%) female and 169 (43.9%) male patients. In relation to the level of education, 152 (39.5%) of the patients were illiterate, 127 (33.0%) had primary education, 72 (18.7%) had secondary education, and 34 (8.8%) were graduates or higher.





Age (years, mean ± SD)	54.6 ± 10.8
Gender (F/M)	216 (56.1%) / 169 (43.9%)
Type 2 DM	327 (84.9%)
Type 1 DM	58 (15.1%)
Duration of DM (years)	8.4 ± 5.7
HbA1c (%)	8.7 ± 1.4
Dermopathy present	134 (34.8%)

In terms of occupation, 102 (26.5%) were housewives, 94 (24.4%) were laborers, 85 (22.1%) were office workers, 67 (17.4%) were retired, and 37 (9.6%) had other occupations.

Out of the parameters related to diabetes, 327 patients (84.9%) had type 2 diabetes mellitus (DM), and 58 patients (15.1%) had type 1 DM. The duration of diabetes ranged from 1–25 years with a mean of 8.4 ± 5.7 years, and the mean HbA1c was 8.7 ± 1.4%, reflecting suboptimal glycemic control in most participants.

Diabetic dermopathy (DD) was found to have a frequency of 34.8% (n=134) in the study group. 75 (56.0%) were female, and 59 (44.0%) were male among patients with DD. The average age of DD patients was 56.8 ± 9.9 years, which was significantly older than patients without DD (p = 0.03). The average duration of diabetes in DD patients was 10.2 ± 5.4 years, significantly longer than without DD (p = 0.001). The average diabetes control, as measured by HbA1c, in the patients with DD was 9.0 ± 1.3%, also significantly higher than in patients without DD (p = 0.02), suggesting a correlation of poor glycemic control with diabetic dermopathy.

Comparison Between Patients with and Without Diabetic Dermopathy

Parameter	With Dermopathy (n=134)	Without Dermopathy (n=251)	p-value
Mean age (years)	56.8 ± 9.9	53.5 ± 11.2	0.03 *
Female gender	75 (56.0%)	141 (56.2%)	0.97
Mean duration in (years)	10.2 ± 5.4	7.5 ± 5.7	0.001 *
Mean HbA1c (%)	9.0 ± 1.3	8.5 ± 1.4	0.02 *
Retinopathy present	92 (68.7%)	108 (43.0%)	<0.001 *
Nephropathy present	77 (57.5%)	93 (37.0%)	0.002 *
Neuropathy present	89 (66.4%)	112 (44.6%)	<0.001 *

*Significant at p < 0.05

In patients with dermopathy, the lesions were found most frequently on the shins (88.8%), followed by the forearms (7.5%) and thighs (3.7%). Bilateral lesions were observed in 82.1% of patients, and 17.9% had unilateral lesions. The lesions varied from 2 to 12 per patient, with a mean of 5.1 ± 2.3. Pruritus was associated in 11.9% of the patients.

Site and Lesion Characteristics in Patients with Diabetic Dermopathy (n = 134)

Parameter	Frequency (%)
Location of Lesions	
Shins	119 (88.8%)
Forearms	10 (7.5%)
Thighs	5 (3.7%)
Laterality of Lesions	
Bilateral	110 (82.1%)
Unilateral	24 (17.9%)
Number of Lesions per Patient	2 – 12 (Mean 5.1 ± 2.3)
Associated Pruritus	16 (11.9%)

Among the 134 dermopathy patients, 68.7% had diabetic retinopathy, 57.5% had nephropathy, and 66.4% had neuropathy, and all these associations were statistically significant. These results show that dermopathy presence was strongly associated with diabetic microvascular complications.

Association of Diabetic Dermopathy with Microvascular Complications (n = 134)

Complication	Frequency (%)	p-value
Diabetic Retinopathy	92 (68.7%)	< 0.001
Diabetic Nephropathy	77 (57.5%)	0.002
Diabetic Neuropathy	89 (66.4%)	< 0.001

Independent samples t-tests revealed that patients with dermopathy had significantly higher age, longer duration of diabetes, and elevated HbA1c levels compared to those without dermopathy. Chi-square tests demonstrated a significant association between dermopathy and the presence of retinopathy, nephropathy, and neuropathy, while no significant association was found between dermopathy and gender.

DISCUSSION

Diabetic dermopathy (DD) was found to occur in 34.8% of diabetes mellitus patients in a tertiary care center in Nawabshah, consistent with recent Pakistani regional data and similar international estimates. Shaikh et al. conducted a study in Lahore and found 36% of the patients with cutaneous manifestations of type 2 diabetes, similar to our results[16]. Likewise, Muzaffar et al. documented DD in 28% of diabetic patients in Lahore, whereas Haroon and Hussain in Karachi reported 41% frequency, indicating local differences attributable to varying patient profiles, glycemic control, and access to healthcare across Pakistani regions[17,18]. Our data corroborate the applicability of the same in the local epidemiology of DD in Sindh that is as yet underreported.

Globally, our findings are in agreement with Al-Mutairi and Sharma's study in Kuwait, with 37% prevalence, and Mahajan et al.'s study in India with 33% prevalence, validating that DD is a common skin manifestation in various populations[19,20]. Recently, Pradhan et al. conducted a study in India with a prevalence of 42%, whereas a systematic review conducted by Bissong et al. addressed variations in prevalence worldwide, as an indicator of the effects of genetic, environmental, and healthcare-related influences[21,22].

In our group, the average patient age with DD was 56.8 years, which is greater than in those without DD, showing a trend toward rising frequency with increasing age, which is in line with international data suggesting DD is more frequent among middle-aged and older patients[20]. We also noted a much longer duration of diabetes (mean 10.2 years) in DD patients, consistent with observations by Demirseren et al., who found an increased

prevalence of DD in cases of longer diabetes duration, highlighting the pathogenetic contribution of chronic hyperglycemia and microangiopathy[23].

Notably, in our study, poor glycemic control was strongly correlated with DD (mean HbA1c 9.0%), consistent with the findings of Bhat et al., where an increased HbA1c level was found to be correlated with a higher frequency of DD, highlighting the etiological role of hyperglycemia in microvascular complications[24]. This lends support to the perception that DD can be an outward clinical indicator of poor metabolic control in diabetic patients, especially in resource-poor settings.

Our research showed a strong correlation between DD and microvascular complications, with retinopathy in 68.7%, nephropathy in 57.5%, and neuropathy in 66.4% of patients with DD. These results concur with Romano et al., who also found robust correlations between DD and diabetic microangiopathy, and Abdelraheem et al., who found DD to be a potential non-invasive indicator of microvascular complications in clinical practice[25,26]. Recently, Hassan et al. also documented that the existence of DD in diabetic patients corresponds with an increase in the risk of retinopathy and neuropathy, which reiterates clinical relevance of DD as part of integrative diabetes management[27].

The most frequently involved location was the pretibial region (88.8%) in our study, as per the literature that reports trauma-susceptible areas with superimposed microangiopathy to be characteristic sites for DD[17,20]. The asymptomatic and bilateral presentation on an average of 5.1 lesions per patient in our cohort is also in keeping with earlier reports, facilitating effortless clinical identification of DD without resorting to invasive diagnostic methods, which is especially useful in health resource-limited settings[28].

The World Health Organization stresses the inclusion of non-communicable disease care in primary care, pointing to the use of simple clinical indicators like DD in the early identification of systemic complications, especially in low-resource environments[29]. Use of DD as a clinical indicator may enable early detection of patients susceptible to retinopathy, nephropathy, and neuropathy and lead to early interventions and possibly decreased morbidity among diabetic patients.

The findings of our study add to the scant local literature on DD in Sindh and attest to its utility as a low-cost, non-invasive clinical marker for poor glycemic control and microangiopathic complications of diabetes mellitus, highlighting its utility in Pakistan's routine diabetic practice.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

FUNDING: The work was not financially supported by any organization. The entire expense was taken by the authors.

ACKNOWLEDGEMENTS: We are thankful to all who were involved in our study.

AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared

REFERENCES

1. American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes Care. 2017;40(Suppl 1):S11-S24.
2. International Diabetes Federation. IDF Diabetes Atlas, 10th edn. Brussels: IDF; 2021.
3. Basit A, Fawwad A, Qureshi H, Shera AS. Prevalence of diabetes, pre-diabetes and associated risk factors: second National Diabetes Survey of Pakistan (NDSP), 2016-2017. BMJ Open. 2018;8(8):e020961.
4. Bissong MEA, Nchafatso G, Nchang SN, Tabe B, Njamnshi AK. Cutaneous manifestations of diabetes mellitus in sub-

Saharan Africa: a systematic review. BMC Endocr Disord. 2021;21(1):96.
5. Smith SB, Everton J, Argento NB. Diabetic dermopathy: a review. J Clin Aesthet Dermatol. 2018;11(9):42-47.
6. Melin HH, Good RA. Cutaneous vascular changes associated with diabetes mellitus. Diabetes. 1964;13(5):387-392.
7. Nigam PK. Diabetic dermopathy and other dermatologic manifestations of diabetes mellitus. Indian J Dermatol. 2019;64(3):191-198.
8. Rongioletti F, Rebora A. Cutaneous manifestations of diabetes mellitus. In: Goldsmith LA, Katz SI, Gilchrest BA, et al., editors. Fitzpatrick's Dermatology in General Medicine. 8th ed. New York: McGraw-Hill; 2012. p. 1344-1352.
9. Pickup JC, Williams G. Textbook of Diabetes. 4th ed. Oxford: Wiley-Blackwell; 2017.
10. Demirseren DD, Emre S, Akoglu G, et al. Relationship between skin diseases and extracutaneous complications of diabetes mellitus: clinical analysis of 750 patients. Am J Clin Dermatol. 2017;18(4):565-570.
11. Pradhan S, Dash G, Tripathy R, Das S. Clinico-epidemiological study of cutaneous manifestations in diabetes mellitus. Indian J Dermatol. 2017;62(6):675-682.
12. Shaikh WA, Memon AA, Ali SA, Rathi SL. Frequency of cutaneous manifestations in type 2 diabetes mellitus patients. Pak J Med Health Sci. 2016;10(1):152-154.
13. Muzaffar F, Hussain I, Haroon TS. Diabetic dermopathy: a study of 858 cases. J Pak Assoc Dermatol. 2016;26(3):152-155.
14. Hassan I, Rather PA, Qazi MA, Hakeem H. Diabetic dermopathy: A marker of retinopathy and neuropathy. J Diabetes Metab Disord. 2020;19(1):197-202.
15. Al-Mutairi N, Sharma AK. Cutaneous manifestations of diabetes mellitus: a study from Kuwait. Med Princ Pract. 2016;25(6):567-573.
16. Shaikh WA, Memon AA, Ali SA, Rathi SL. Frequency of cutaneous manifestations in type 2 diabetes mellitus patients. Pak J Med Health Sci. 2016;10(1):152-154.
17. Muzaffar F, Hussain I, Haroon TS. Diabetic dermopathy: a study of 858 cases. J Pak Assoc Dermatol. 2016;26(3):152-155.
18. Haroon TS, Hussain I. Diabetic dermopathy: clinical and histopathological study of 50 cases. J Pak Med Assoc. 2016;66(1):11-13.
19. Al-Mutairi N, Sharma AK. Cutaneous manifestations of diabetes mellitus: a study from Kuwait. Med Princ Pract. 2016;25(6):567-573.
20. Mahajan S, Koranne RV, Sharma SK. Cutaneous manifestations of diabetes mellitus. Indian J Dermatol Venereol Leprol. 2016;82(2):105-110.
21. Pradhan S, Dash G, Tripathy R, Das S. Clinico-epidemiological study of cutaneous manifestations in diabetes mellitus. Indian J Dermatol. 2017;62(6):675-682.
22. Bissong MEA, Nchafatso G, Nchang SN, Tabe B, Njamnshi AK. Cutaneous manifestations of diabetes mellitus in sub-Saharan Africa: a systematic review. BMC Endocr Disord. 2021;21(1):96.
23. Demirseren DD, Emre S, Akoglu G, et al. Relationship between skin diseases and extracutaneous complications of diabetes mellitus: clinical analysis of 750 patients. Am J Clin Dermatol. 2017;18(4):565-570.
24. Bhat YJ, Gupta V, Kudyar RP. Cutaneous manifestations of diabetes mellitus: a study from North India. Int J Diabetes Dev Ctries. 2016;36(2):212-217.
25. Romano G, Moretti G, Di Benedetto A, et al. Skin lesions in diabetes mellitus: prevalence and clinical correlations. Diabetes Res Clin Pract. 2016;120:71-77.
26. Abdelraheem MH, Mustafa AA, Ahmed AA. Diabetic dermopathy: a marker of microvascular complications. Sudan J Paediatr. 2017;17(2):29-34.
27. Hassan I, Rather PA, Qazi MA, Hakeem H. Diabetic dermopathy: A marker of retinopathy and neuropathy. J Diabetes Metab Disord. 2020;19(1):197-202.
28. Goyal A, Tanwar S, Sharma S, Verma S, Goyal P. Cutaneous manifestations of diabetes mellitus: A hospital-based study. J Family Med Prim Care. 2020;9(6):2768-2773.
29. World Health Organization. WHO Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings. Geneva: WHO; 2020.