DOI：10.6314/JIMT.202306_34(3).06　　內科學誌　2023：34：199-222

# 2018 年糖尿病健康促進機構品管調查結果報告—糖尿病足部病變之流行病學與相關危險因子探討

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## 摘　要

糖尿病足部潰瘍為糖尿病併發症之一且會造成非創傷性截肢。足部潰瘍的原因以糖尿病周邊神經病變或周邊動脈血管疾病為主，因此了解糖尿病足部疾病等盛行率與風險因子對後續非創傷性截肢的預防非常重要。本研究為一橫斷面調查，收錄5,720位第2型糖尿病病人，藉由問卷了解足部病變之流行病學及危險因子。雖然這四種糖尿病足部病變息息相關，但每種疾病各有不同的危險因子，也反映了這四種疾病多元的致病機轉。整體來說，2018年台灣糖尿病周邊神經病變、動脈血管疾病、足部潰瘍以及截肢的盛行率比過去其他地區的報告還低，但疾病危險因子是相似的。

關鍵詞：第 2 型糖尿病 (T2DM)、糖尿病足部病變 (diabetic foot)、糖尿病足部潰瘍 (diabetic foot ulcers)、周邊動脈血管疾病 (peripheral neuropathy)、周邊神經病變 (peripheral arterial diseases)

## 引言

糖尿病足部潰瘍是糖尿病嚴重併發症之一，大部分的足部潰瘍是由糖尿病周邊神經病變或者是周邊動脈血管疾病引起[1]。糖尿病是非創傷性截肢的重要原因之一[2]。據統計，約有84%的糖尿病截肢與糖尿病足部潰瘍有關[3]。隨著糖尿病的盛行率逐漸增加，推測罹患糖尿病併發症的病人也會逐漸增加，因此，了解目前糖尿病足部潰瘍、周邊神經病變以及周邊動脈血管疾病等的盛行率與相關風險因子對後續糖尿病併發症的預防是非常重要的。本研究藉由問卷的方式收集台灣糖尿病足部潰瘍、糖尿病周邊神經病變、糖尿病周邊動脈血管疾病及截肢之相關流行病學及其危險因子來探討其可能的成因，藉此做為後續改善照護品質的依據。

## 材料及方法

本研究為一橫斷面調查。納入條件為2018年在各健康促進機構治療糖尿病滿一年以上且年滿18歲以上之門診病人，以隨機取樣方式且願意簽屬參與同意書者進行研究。另外，本研

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究排除重複收案患者以及不願意或不能配合計畫書要求的病人。門診中先以問卷的方式調查基本資料以及生活品質、活動量以及飲食等問卷調查，之後生理檢驗結果，包含空腹血糖、糖化血色素、總膽固醇、低密度膽固醇、三酸甘油脂、高密度膽固醇、肌酸酐等以收案當次門診前後三個月的檢查進行登錄。

統計部分使用 SAS 統計軟體第 9.4 版本進行資料統計分析 (SAS Institute Inc., Cary, NC, USA)。非常態分布之連續變項以中位數 (Median) 與四分位距 (interquartile range, IQR) 表示。類別變項以樣本數 (n[%]) 呈現。我們使用 Wilcoxon rank sum test 檢定分析連續變項之差異，並且使用 chi-square test 或 Fisher's exact test 來檢定類別變項間是否存在統計差異。另外，使用邏輯式迴歸模型來預測 odds ratio (OR) 以及 95% 信賴區間 (confidence interval, CI)。在多元迴歸分析中，以向後選取法 (backward selection method) 來計算風險因子。在本研究中將 $p$ 值小於 0.05 定義為具統計意義。

## 結　果

在 2018 年總共有 5,855 位病人加入糖尿病健康促進機構品管調查，排除第 1 型糖尿病 114 人及其他類型糖尿病 17 人後，另有 4 位未滿 18 歲，最後共有 5,720 位第 2 型糖尿病且年滿 18 歲以上者納入本研究。在排除缺失資料後，足部潰瘍、周邊動脈血管病變、糖尿病神經病變以及截肢的盛行率分別為 0.9% (n=51)、1.33% (n=73)、4.6% (n=256) 以及 0.2% (n=14)。病人的臨床特徵包含就醫資訊、年齡、性別、教育程度、是否參與糖尿病共同照護網、吸菸有無、血壓、用藥史、運動狀況及神經病變疼痛量表皆列於表一之中。從表一可見，在四個疾病分析中大部分的參與者 (92.3%、92.6%、92.7%、92.2%) 都有加入糖尿病共同照護網，平均年齡為 64 歲，且大部分的參與者來自北部區域醫學中心、為非吸菸者。糖化血色素未達標者 (A1C ≥ 7%) 在各組別中約佔 55~56%。

根據調查，足部潰瘍病人主要分布在北部 (47.1%) 以及南部 (47.0%) 醫院，而中部 (5.9%) 和東部醫院 (0.0%) 則比較少；此外，足部潰瘍比率以南部最高 (1.4%)，北部其次 (0.9%)，中部 (0.3%) 及東部 (0%) 較低 ($p$ = 0.006)。足部潰瘍病人比沒有潰瘍病人有較高的收縮壓 (139 mmHg vs 132 mmHg, $p$ = 0.022) 及肌酸酐 (1.2 mg/dL vs 0.9 mg/dL, $p$ < 0.001)。另外，足部潰瘍病人男性較多 (70.6%, $p$ = 0.005)、曾經抽菸 (21.6%) 或現在正在抽菸者 (25.5%) 比例也較多 ($p$ = 0.003)。在用藥方面，有潰瘍者使用胰島素比例 (54.0%, $p$ < 0.001) 以及未使用降血脂藥物比例 (43.1%, $p$ = 0.014) 較多。另外，在衛教方面可以看到潰瘍患者參與衛教次數小於等於兩次及大於五次比例都比沒有潰瘍患者多 (0 次 : 17.6% vs 8.0%; 1 次 : 11.8% vs 9.8%; 2 次 : 17.6% vs 8.5%; 大於五次 : 15.7% vs 13.0%, $p$ = 0.006)。此外在神經病變疼痛量表評估當中有潰瘍者大於四分的比例較無潰瘍者多 (23.5% vs 2.3%, $p$ < 0.001)。表二 ( 一 ) 呈現了經單變數以及多變數分析預估的勝算比。在單變數分析中，性別、抽菸有無、收縮壓、肌酸酐、是否使用血脂藥、胰島素使用、參與衛教、運動及疼痛量表皆與潰瘍相關。在多變數分析中，男性比女性更容易有足部潰瘍 (OR, 3.22; 95% CI: 1.51-6.86)。使用胰島素的病人也有比較高的機會會有足部潰瘍 (OR, 2.05; 95% CI: 1.03-4.08)。神經疼痛量表分數越高 ( 三分或四分以上 ) 也有較高的足部潰瘍勝算比 (OR: 5.10 and 14.67)。

周邊動脈血管病變病人主要分布在醫學中心 (34.3%) 與區域醫院 (35.6%)，而周邊動脈血管病變的比率以地區醫院為最高 (13.5%, $p$ < 0.001)，而肌酸酐也較高 (1.0 mg/dL vs 0.9 mg/dL, $p$ < 0.001)。另外，周邊動脈血管病變病人有較高的比例教育程度為文盲 (13.7% vs 4.9%) 或是小學畢業 (32.9% vs 30.0%, $p$ = 0.007)、糖化血色素大於或等於 7 (69.9% vs 55.2%, $p$ = 0.012)、使用抗血小板藥物 (39.7% vs 17.5%, $p$ < 0.001)、使用胰島素 (43.8% vs 28.0%, $p$ = 0.003)。此外，在神經病變疼痛量表評估 0 分比例較低 (38.4% vs 85.2%, $p$ < 0.001)。在單變數回歸分析中 ( 表二 ( 二 ))，醫院的層級、教育程度、糖化血色

素、肌酸酐、抗血小板藥物及胰島素使用、營養師衛教、運動頻率、以及疼痛分數都與周邊動脈血管疾病有關。在多變數回歸分析 ( 表二 ( 二 )) 中，醫院的層級、抗血小板藥物以及疼痛分數都還是跟周邊血管動脈疾病獨立相關。而區域醫院 (OR, 2.13; 95% CI: 1.17-3.88) 及地區醫院 (OR, 28.19; 95% CI:13.13-60.52) 的勝算比都比醫學中心高。有使用抗血小板藥物的病人相對沒使用的有較高比例有周邊血管動脈疾病 (OR, 2.76; 95% CI: 1.62-4.69)。神經疼痛量表分數越高也越增加動脈血管疾病的勝算比 (OR: 4.34 to 38.48)。

糖尿病周邊神經病變病人主要分布在北部醫院 (44.9%)，而南部醫院 (27.4%) 次之，而比例上以東部醫院 (9.6%) 最多 ($p < 0.001$)。在醫院層級方面，糖尿病周邊神經病變的病人主要分布在醫學中心 (42.6%) 與區域醫院 (41.4%)，而比例上則以地區醫院 (8.3%) 最多 ($p < 0.001$)。在所有病人中，文盲 (7.9% vs 4.8%)、小學畢業 (39.8% vs 29.5%)、初中畢業 (16.5% vs 15.5%, $p < 0.001$) 的周邊神經病變病人比例較高。與沒有周邊神經病變的病人相比，有周邊神經病變的病人年齡較大 ( 中位數：66 歲 vs 64 歲，$p = 0.001$) 且肌酸酐更高 (1.1 mg/dL vs 0.9 mg/dL, $p < 0.001$)。此外，有糖尿病周邊神經病變患者糖化血色素大於或等於 7%(62.7% vs 54.9%, $p = 0.014$)、使用抗血小板藥物 (25.5% vs 17.2%, $p < 0.001$)、使用高血壓藥物 (65.6% vs 55.1%) 或胰島素（44.7% vs 27.1%, $p < 0.001$)，未使用糖尿病口服藥物 (11.3% vs 6.6%, $p = 0.004$)，以及有最短的運動時間 (55.5% vs 46.9%, $p = 0.019$) 的比率都比較高。此外，糖尿病周邊神經病變病人的疼痛評分 0 分比例較低 (22.3% vs 87.5%, $p < 0.001$）。在單變數分析 ( 表二 ( 三 )) 中，醫院地區、醫院等級、年齡、教育程度、身體質量指數、糖化血色素、肌酸酐、高密度脂蛋白、抗血小板藥物、高血壓藥物、糖尿病口服藥物、胰島素、營養衛教、運動時間、疼痛評分都與周邊神經病變顯著相關。而在多變數分析中，醫院地區、醫院等級、是否參與糖尿病共同照護網、高血壓藥物使用、胰島素使用、營養衛教、疼痛評分分數都仍與周邊神經病變顯著相關。其中，東部地區病人 (OR, 4.58；95% CI：2.46-8.54) 的風險高於北部地區的病人。區域醫院 (OR, 2.52; 95% CI:1.73-3.69) 和地區醫院 (OR, 4.38; 95% CI:1.84-10.45) 的勝算比均高於醫學中心，而診所則較低 (OR, 0.52; 95% CI:0.27-0.46)。使用高血壓藥物 (OR,1.42; 95% CI:1.03-1.95) 和胰島素 (OR,1.65; 95% CI:1.20-2.25) 的病人發生周邊神經病變的風險更高。參加糖尿病共同照護網的病人發生周邊神經病變的風險較低 (OR, 0.45; 95% CI:0.23-0.89)。參加營養衛教的病人發生周邊神經病變的風險高於未參加的病人 (OR,1.96~3.00)。隨著疼痛評分的增加，周邊神經病變的勝算比也增加 (OR,15.83~82.80)。

就截肢而言，截肢病人比起非截肢者有較低的高密度脂蛋白 (38 mg/dL vs 46 mg/dL, $p = 0.024$) 且有比較高的比例使用胰島素 (57.1% vs 27.9%, $p = 0.031$)，以及至少一星期運動一次 (85.7% vs 45.8%, $p = 0.003$)。截肢病人的神經疼痛量表分數分數 0 分比例也較低 (50.0% vs 84.4%, $p < 0.001$)。在單變數分析 ( 表二 ( 四 )) 中，醫院等級、年齡、性別、抽煙情況、舒張壓、肌酐酸、總膽固醇、高密度脂蛋白、低密度脂蛋白、抗血小板藥物、高血壓藥物、高脂血症藥物、糖尿病口服、胰島素、運動情況、神經疼痛量表分數與截肢都有顯著關係。而在多變數分析中，年紀愈大截肢風險越低 (OR, 0.96; 95% CI: 0.92-0.99)，運動者的風險也比沒運動者低 (OR, 0.19; 95% CI: 0.04-0.86)。此外，疼痛分數大於四分以上時，截肢風險也較高 (OR,16.83; 95% CI: 4.06-69.73)。

## 討　論

本調查中，4.6% (256 人 ) 的病人有糖尿病周邊神經病變。過去美國及歐洲的橫斷面研究中發現，糖尿病周邊神經病變的盛行率會因為個案的年齡、糖尿病罹病時間長短、血糖控制良窳程度以及糖尿病類型而有所不同，整體盛行率約在 6% 到 51%[4]，而過去台灣中部某一醫學中心的研究發現，糖尿病周邊神經病變盛行

表一：
（一）足部潰瘍有無兩組之間臨床特徵之比較

| Variables | Total | Foot ulcer | | *p*-value |
|---|---|---|---|---|
| | (n=5,673) | Yes (n=51) | No (n=5,622) | |
| **Hospital information** | | | | |
| Area | | | | **0.006** |
| North | 2661 (46.9) | 24 (47.1) | 2637 (46.9) | |
| Central | 1055 (18.6) | 3 (5.9) | 1052 (18.7) | |
| South | 1666 (29.4) | 24 (47.0) | 1642 (29.2) | |
| East | 291 (5.1) | 0 (0.0) | 291 (5.2) | |
| Hospital level | | | | 0.111 |
| Academic medical centers | 3010 (53.1) | 26 (51) | 2984 (53.1) | |
| Regional hospital | 1521 (26.8) | 20 (39.2) | 1501 (26.6) | |
| District hospital | 122 (2.2) | 0 (0.0) | 122 (2.2) | |
| Clinic | 1020 (18.0) | 5 (9.8) | 1015 (18.1) | |
| **Demography** | | | | |
| Age | 64.0 (56.0-70.0) | 63.0 (52.0-70.0) | 64.0 (56.0-70.0) | 0.288 |
| Sex | | | | **0.005** |
| Male | 2891 (51.0) | 36 (70.6) | 2855 (50.8) | |
| Female | 2782 (49.0) | 15 (29.4) | 2767 (49.2) | |
| Educational level | | | | 0.812 |
| Illiteracy | 282 (5.0) | 2 (3.9) | 280 (5.0) | |
| Elementary school | 1688 (30.0) | 15 (29.4) | 1673 (29.9) | |
| Junior high school | 887 (15.7) | 7 (13.7) | 880 (15.8) | |
| Senior high school | 1471 (26.1) | 17 (33.4) | 1454 (26.0) | |
| College and above | 1309 (23.2) | 10 (19.6) | 1299 (23.3) | |
| Participate DSCN | | | | 0.112 |
| Yes | 5228 (92.3) | 44 (86.3) | 5184 (92.3) | |
| No | 439 (7.7) | 7 (13.7) | 432 (7.7) | |
| Cigarette smoking | | | | **0.003** |
| Non-smoker | 4159 (73.3) | 27 (52.9) | 4132 (73.5) | |
| Former smoker | 779 (13.7) | 11 (21.6) | 768 (13.7) | |
| Current smoker | 733 (12.9) | 13 (25.5) | 720 (12.8) | |
| BMI ($kg/m^2$) | | | | 0.745 |
| <18.5 | 60 (1.1) | 0 (0.0) | 60 (1.1) | |
| 18.5-24 | 1700 (30.0) | 16 (31.4) | 1684 (30.0) | |
| 24-27 | 1718 (30.3) | 13 (25.5) | 1705 (30.3) | |
| ≥ 27 | 2193 (38.7) | 22 (43.1) | 2171 (38.6) | |
| SBP (mmHg) | 132.0 (121.0-143.0) | 139.0 (126.0-147.0) | 132.0 (121.0-143.0) | **0.022** |
| DBP (mmHg) | 75.0 (68.0-82.0) | 78.0 (67.0-83.0) | 75.0 (68.0-82.0) | 0.432 |

| | | | | |
|---|---|---|---|---|
| **Laboratory measurement** | | | | |
| A1C (%) | | | | 0.297 |
| <7 | 2522 (44.5) | 19 (37.3) | 2503 (44.6) | |
| ≥ 7 | 3147 (55.5) | 32 (62.7) | 3115 (55.4) | |
| Creatinine (mg/dL) | 0.9 (0.7-1.1) | 1.2 (0.9-1.9) | 0.9 (0.7-1.1) | **<0.001** |
| TC (mg/dL) | 155.0 (136.0-176.0) | 153.5 (131.0-189.0) | 155.0 (136.0-176.0) | 0.968 |
| TG (mg/dL) | 116.0 (82.0-167.0) | 115.0 (91.0-179.0) | 116.0 (82.0-166.0) | 0.533 |
| HDL – C (mg/dL) | 46.0 (38.0-54.6) | 45.0 (35.4-53.0) | 46.0 (38.0-55.0) | 0.305 |
| LDL – C (mg/dL) | 86.0 (70.0-103.0) | 86.5 (71.0-102.0) | 86.0 (70.0-103.0) | 0.937 |
| **Medication use for diabetes (any)** | | | | 0.158 |
| Yes | 5417 (95.9) | 47 (92.2) | 5370 (95.9) | |
| No | 233 (4.1) | 4 (7.8) | 229 (4.1) | |
| Antiplatelet drugs | | | | 0.963 |
| Yes | 1014 (17.9) | 9 (17.6) | 1005 (17.9) | |
| No | 4653 (82.1) | 42 (82.4) | 4611 (82.1) | |
| Hypertension drugs | | | | 0.062 |
| Yes | 3157 (55.7) | 35 (68.6) | 3122 (55.6) | |
| No | 2512 (44.3) | 16 (31.4) | 2496 (44.4) | |
| Hyperlipidemia drugs | | | | **0.014** |
| Yes | 4097 (72.3) | 29 (56.9) | 4068 (72.4) | |
| No | 1573 (27.7) | 22 (43.1) | 1551 (27.6) | |
| Diabetes oral drugs | | | | 0.776 |
| Yes | 5288 (93.2) | 47 (92.2) | 5241 (93.2) | |
| No | 384 (6.8) | 4 (7.8) | 380 (6.8) | |
| Insulin | | | | **<0.001** |
| Yes | 1579 (27.9) | 27 (54.0) | 1552 (27.7) | |
| No | 4076 (72.1) | 23 (46.0) | 4053 (72.3) | |
| **Health education** | | | | |
| Nursing (times) | | | | **0.006** |
| 0 | 459 (8.1) | 9 (17.6) | 450 (8.0) | |
| 1 | 560 (9.9) | 6 (11.8) | 554 (9.8) | |
| 2 | 484 (8.5) | 9 (17.6) | 475 (8.5) | |
| 3 | 587 (10.4) | 2 (3.9) | 585 (10.4) | |
| 4 | 2841 (50.1) | 17 (33.3) | 2824 (50.3) | |
| 5+ | 738 (13.0) | 8 (15.7) | 730 (13.0) | |
| Nutrition (times) | | | | 0.668 |
| 0 | 1009 (17.8) | 10 (19.6) | 999 (17.8) | |
| 1 | 832 (14.7) | 10 (19.6) | 822 (14.6) | |
| 2 | 561 (9.9) | 4 (7.8) | 557 (9.9) | |
| 3 | 462 (8.2) | 3 (5.9) | 459 (8.2) | |

| | | | | |
|---|---|---|---|---|
| 4 | 2280 (40.2) | 17 (33.4) | 2263 (40.3) | |
| 5+ | 525 (9.3) | 7 (13.7) | 518 (9.2) | |
| **Exercise situation** [a] | | | | |
| Frequency (days/week) | | | | 0.024 |
| 0 | 2605 (46.0) | 32 (62.7) | 2573 (45.8) | |
| 1-3 | 970 (17.1) | 10 (19.6) | 960 (17.1) | |
| 4-6 | 686 (12.1) | 1 (2.0) | 685 (12.2) | |
| 7 | 1407 (24.8) | 8 (15.7) | 1399 (24.9) | |
| Duration (minutes) | | | | **0.01** |
| 0-10 | 2698 (47.6) | 34 (66.7) | 2664 (47.4) | |
| 11-30 | 1331 (23.5) | 9 (17.6) | 1322 (23.5) | |
| 31-60 | 1246 (22.0) | 3 (5.9) | 1243 (22.1) | |
| 60+ | 396 (7.0) | 5 (9.8) | 391 (7.0) | |
| **Douleur Neuropathique 4 score** | | | | **<0.001** |
| 0 | 4782 (84.3) | 26 (51.0) | 4756 (84.6) | |
| 1 | 413 (7.3) | 5 (9.8) | 408 (7.3) | |
| 2 | 219 (3.9) | 3 (5.9) | 216 (3.8) | |
| 3 | 118 (2.1) | 5 (9.8) | 113 (2.0) | |
| 4+ | 141 (2.5) | 12 (23.5) | 129 (2.3) | |

（二）周邊動脈血管病變有無兩組之間臨床特徵之比較

| Variables | Total | Peripheral angiopathy | | *p*-value |
|---|---|---|---|---|
| | (n=5,494) | Yes (n=73) | No (n=5,421) | |
| **Hospital information** | | | | |
| Area | | | | 0.176 |
| North | 2632 (47.9) | 36 (49.3) | 2596 (47.9) | |
| Central | 1051 (19.1) | 20 (27.5) | 1031 (19.0) | |
| South | 1520 (27.7) | 15 (20.5) | 1505 (27.8) | |
| East | 291 (5.3) | 2 (2.7) | 289 (5.3) | |
| Hospital level | | | | **<0.001** |
| Academic medical centers | 2924 (53.2) | 25 (34.3) | 2899 (53.5) | |
| Regional hospital | 1439 (26.2) | 26 (35.6) | 1413 (26.0) | |
| District hospital | 119 (2.2) | 16 (21.9) | 103 (1.9) | |
| Clinic | 1012 (18.4) | 6 (8.2) | 1006 (18.6) | |
| **Demography** | | | | |
| Age | 64.0 (56.0-70.0) | 66.0 (60.0-72.0) | 64.0 (56.0-70.0) | 0.056 |
| Sex | | | | 0.634 |
| Male | 2783 (50.7) | 39 (53.4) | 2744 (50.6) | |
| Female | 2711 (49.3) | 34 (46.6) | 2677 (49.4) | |
| Educational level | | | | **0.007** |

| | | | | |
|---|---|---|---|---|
| Illiteracy | 272 (5.0) | 10 (13.7) | 262 (4.9) | |
| Elementary school | 1640 (30.0) | 24 (32.9) | 1616 (30.0) | |
| Junior high school | 851 (15.6) | 8 (11.0) | 843 (15.6) | |
| Senior high school | 1420 (26.0) | 19 (26.0) | 1401 (26.0) | |
| College and above | 1276 (23.4) | 12 (16.4) | 1264 (23.5) | |
| Participate DSCN | | | | 0.778 |
| Yes | 5084 (92.6) | 67 (91.8) | 5017 (92.7) | |
| No | 404 (7.4) | 6 (8.2) | 398 (7.3) | |
| Cigarette smoking | | | | 0.974 |
| Non-smoker | 4042 (73.6) | 53 (72.6) | 3989 (73.6) | |
| Former smoker | 746 (13.6) | 10 (13.7) | 736 (13.6) | |
| Current smoker | 705 (12.8) | 10 (13.7) | 695 (12.8) | |
| BMI ($kg/m^2$) | | | | 0.895 |
| <18.5 | 61 (1.1) | 1 (1.4) | 60 (1.2) | |
| 18.5-24 | 1651 (30.1) | 19 (26.0) | 1632 (30.1) | |
| 24-27 | 1661 (30.2) | 23 (31.5) | 1638 (30.2) | |
| ≥ 27 | 2119 (38.6) | 30 (41.1) | 2089 (38.5) | |
| SBP (mmHg) | 132.0 (121.0-143.0) | 134.0 (126.0-147.0) | 132.0 (121.0-143.0) | 0.199 |
| DBP (mmHg) | 75.0 (68.0-82.0) | 77.0 (69.0-84.0) | 75.0 (68.0-82.0) | 0.445 |
| **Laboratory measurement** | | | | |
| A1C (%) | | | | **0.012** |
| <7 | 2451 (44.6) | 22 (30.1) | 2429 (44.8) | |
| ≥ 7 | 3039 (55.4) | 51 (69.9) | 2988 (55.2) | |
| Creatinine (mg/dL) | 0.9 (0.7-1.1) | 1 (0.8-1.5) | 0.9 (0.7-1.1) | **<0.001** |
| TC (mg/dL) | 155.0 (136.0-176.0) | 155.0 (137.0-178.0) | 155.0 (136.0-176.0) | 0.802 |
| TG (mg/dL) | 116.0 (82.0-166.0) | 122.5 (86.0-178.0) | 116.0 (82.0-166.0) | 0.342 |
| HDL – C (mg/dL) | 46.0 (38.0-54.9) | 43.0 (37.0-50.0) | 46.0 (38.0-55.0) | 0.093 |
| LDL – C (mg/dL) | 86.0 (70.0-103.0) | 83.0 (71.0-107.0) | 86.0 (70.0-103.0) | 0.950 |
| **Medication use for diabetes (any)** | | | | 0.750 |
| Yes | 5269 (96.3) | 70 (95.9) | 5199 (96.3) | |
| No | 201 (3.7) | 3 (4.1) | 198 (3.7) | |
| Antiplatelet drugs | | | | **<0.001** |
| Yes | 975 (17.8) | 29 (39.7) | 946 (17.5) | |
| No | 4513 (82.2) | 44 (60.3) | 4469 (82.5) | |
| Hypertension drugs | | | | 0.127 |
| Yes | 3050 (55.6) | 47 (64.4) | 3003 (55.4) | |
| No | 2440 (44.4) | 26 (35.6) | 2414 (44.6) | |
| Hyperlipidemia drugs | | | | 0.934 |
| Yes | 3963 (72.2) | 53 (72.6) | 3910 (72.2) | |

| | | | | |
|---|---|---|---|---|
| No | 1528 (27.8) | 20 (27.4) | 1508 (27.8) | |
| Diabetes oral drugs | | | | 0.485 |
| Yes | 5117 (93.2) | 70 (95.9) | 5047 (93.1) | |
| No | 376 (6.9) | 3 (4.1) | 373 (6.9) | |
| Insulin | | | | 0.003 |
| Yes | 1542 (28.2) | 32 (43.8) | 1510 (28.0) | |
| No | 3933 (71.8) | 41 (56.2) | 3892 (72.0) | |
| **Health education** | | | | |
| Nursing (times) | | | | 0.222 |
| 0 | 424 (7.7) | 5 (6.8) | 419 (7.7) | |
| 1 | 552 (10.1) | 4 (5.5) | 548 (10.1) | |
| 2 | 471 (8.6) | 5 (6.8) | 466 (8.6) | |
| 3 | 569 (10.4) | 3 (4.2) | 566 (10.4) | |
| 4 | 2778 (50.6) | 46 (63.0) | 2732 (50.5) | |
| 5+ | 696 (12.7) | 10 (13.7) | 686 (12.7) | |
| Nutrition (times) | | | | **0.003** |
| 0 | 971 (17.7) | 8 (11.0) | 963 (17.8) | |
| 1 | 822 (15.0) | 6 (8.2) | 816 (15.1) | |
| 2 | 548 (10.0) | 5 (6.8) | 543 (10.0) | |
| 3 | 438 (8.0) | 1 (1.4) | 437 (8.0) | |
| 4 | 2223 (40.5) | 46 (63.0) | 2177 (40.2) | |
| 5+ | 488 (8.9) | 7 (9.6) | 481 (8.9) | |
| **Exercise situation** [a] | | | | |
| Frequency (days/week) | | | | **0.022** |
| 0 | 2521 (45.9) | 44 (60.3) | 2477 (45.7) | |
| 1-3 | 931 (17.0) | 7 (9.6) | 924 (17.1) | |
| 4-6 | 668 (12.2) | 3 (4.1) | 665 (12.2) | |
| 7 | 1369 (24.9) | 19 (26.0) | 1350 (24.9) | |
| Duration (minutes) | | | | 0.107 |
| 0-10 | 2613 (47.6) | 45 (61.6) | 2568 (47.4) | |
| 11-30 | 1284 (23.4) | 12 (16.5) | 1272 (23.5) | |
| 31-60 | 1207 (22.0) | 13 (17.8) | 1194 (22.0) | |
| 60+ | 388 (7.1) | 3 (4.1) | 385 (7.1) | |
| **Douleur Neuropathique 4 score** | | | | **<0.001** |
| 0 | 4647 (84.6) | 28 (38.4) | 4619 (85.2) | |
| 1 | 400 (7.3) | 13 (17.8) | 387 (7.1) | |
| 2 | 212 (3.9) | 5 (6.8) | 207 (3.9) | |
| 3 | 108 (2.0) | 8 (11.0) | 100 (1.8) | |
| 4+ | 127 (2.3) | 19 (26.0) | 108 (2.0) | |

（三）周邊神經病變有無兩組之間臨床特徵之比較

| Variables | Total | DPN | | *p*-value |
|---|---|---|---|---|
| | (n=5,553) | Yes (n=256) | No (n=5,297) | |
| **Hospital information** | | | | |
| Area | | | | **<0.001** |
| North | 2636 (47.5) | 115 (44.9) | 2521 (47.6) | |
| Central | 1045 (18.8) | 43 (16.8) | 1002 (18.9) | |
| South | 1581 (28.5) | 70 (27.4) | 1511 (28.5) | |
| East | 291 (5.2) | 28 (10.9) | 263 (5.0) | |
| Hospital level | | | | **<0.001** |
| Academic medical centers | 2922 (52.6) | 109 (42.6) | 2813 (53.1) | |
| Regional hospital | 1507 (27.1) | 106 (41.4) | 1401 (26.4) | |
| District hospital | 120 (2.2) | 10 (3.9) | 110 (2.1) | |
| Clinic | 1004 (18.1) | 31 (12.1) | 973 (18.4) | |
| **Demography** | | | | |
| Age | 64.0 (56.0-70.0) | 66.0 (58.0-73.0) | 64.0 (56.0-70.0) | **0.001** |
| Sex | | | | 0.500 |
| Male | 2814 (50.7) | 135 (52.7) | 2679 (50.6) | |
| Female | 2739 (49.3) | 121 (47.3) | 2618 (49.4) | |
| Educational level | | | | **<0.001** |
| Illiteracy | 275 (5.0) | 20 (7.9) | 255 (4.8) | |
| Elementary school | 1654 (30.0) | 101 (39.8) | 1553 (29.5) | |
| Junior high school | 860 (15.6) | 42 (16.5) | 818 (15.5) | |
| Senior high school | 1438 (26.1) | 57 (22.4) | 1381 (26.3) | |
| College and above | 1291 (23.4) | 34 (13.4) | 1257 (23.9) | |
| Participate DSCN | | | | 0.949 |
| Yes | 5141 (92.7) | 237 (92.6) | 4904 (92.7) | |
| No | 406 (7.3) | 19 (7.4) | 387 (7.3) | |
| Cigarette smoking | | | | 0.269 |
| Non-smoker | 4070 (73.3) | 180 (70.3) | 3890 (73.5) | |
| Former smoker | 765 (13.8) | 44 (17.2) | 721 (13.6) | |
| Current smoker | 717 (12.9) | 32 (12.5) | 685 (12.9) | |
| BMI ($kg/m^2$) | | | | 0.206 |
| <18.5 | 61 (1.1) | 6 (2.3) | 55 (1.0) | |
| 18.5-24 | 1659 (29.9) | 70 (27.3) | 1589 (30.0) | |
| 24-27 | 1690 (30.4) | 77 (30.2) | 1613 (30.5) | |
| ≥ 27 | 2141 (38.6) | 103 (40.2) | 2038 (38.5) | |
| SBP (mmHg) | 132.0 (121.0-143.0) | 133.0 (123.0-143.0) | 132.0 (121.0-143.0) | 0.228 |
| DBP (mmHg) | 75.0 (68.0-82.0) | 73.0 (66.0-83.0) | 75.0 (68.0-82.0) | 0.060 |

| | | | | |
|---|---|---|---|---|
| **Laboratory measurement** | | | | |
| A1C (%) | | | | **0.014** |
| <7 | 2482 (44.7) | 95 (37.3) | 2387 (45.1) | |
| ≥ 7 | 3067 (55.3) | 160 (62.7) | 2907 (54.9) | |
| Creatinine (mg/dL) | 0.9 (0.7-1.1) | 1.1 (0.8-1.4) | 0.9 (0.7-1.1) | **<0.001** |
| TC (mg/dL) | 155.0 (136.0-176.5) | 151.0 (136.0-174.0) | 155.0 (136.0-177.0) | 0.207 |
| TG (mg/dL) | 116.0 (82.0-166.0) | 121.0 (87.5-185.0) | 115.0 (82.0-165.0) | 0.067 |
| HDL – C (mg/dL) | 46.0 (38.0-54.9) | 43.0 (38.0-52.3) | 46.0 (38.0-55.0) | 0.059 |
| LDL – C (mg/dL) | 86.0 (70.0-103.0) | 81.2 (69.0-100.0) | 86.0 (70.0-103.0) | 0.093 |
| **Medication use for diabetes (any)** | | | | 0.119 |
| Yes | 5308 (96.0) | 241 (94.1) | 5067 (96.1) | |
| No | 221 (4.0) | 15 (5.9) | 206 (3.9) | |
| Antiplatelet drugs | | | | **<0.001** |
| Yes | 974 (17.6) | 65 (25.5) | 909 (17.2) | |
| No | 4573 (82.4) | 190 (74.5) | 4383 (82.8) | |
| Hypertension drugs | | | | **<0.001** |
| Yes | 3085 (55.6) | 168 (65.6) | 2917 (55.1) | |
| No | 2464 (44.4) | 88 (34.4) | 2376 (44.9) | |
| Hyperlipidemia drugs | | | | 0.679 |
| Yes | 4013 (72.3) | 188 (73.4) | 3825 (72.3) | |
| No | 1537 (27.7) | 68 (26.6) | 1469 (27.7) | |
| Diabetes oral drugs | | | | **0.004** |
| Yes | 5173 (93.2) | 227 (88.7) | 4946 (93.4) | |
| No | 379 (6.8) | 29 (11.3) | 350 (6.6) | |
| Insulin | | | | **<0.001** |
| Yes | 1544 (27.9) | 114 (44.7) | 1430 (27.1) | |
| No | 3991 (72.1) | 141 (55.3) | 3850 (72.9) | |
| **Health education** | | | | |
| Nursing (times) | | | | 0.668 |
| 0 | 421 (7.6) | 20 (7.8) | 401 (7.6) | |
| 1 | 552 (10.0) | 18 (7.1) | 534 (10.1) | |
| 2 | 476 (8.6) | 21 (8.3) | 455 (8.5) | |
| 3 | 584 (10.5) | 25 (9.8) | 559 (10.6) | |
| 4 | 2801 (50.5) | 134 (52.5) | 2667 (50.4) | |
| 5+ | 715 (12.9) | 37 (14.5) | 678 (12.8) | |
| Nutrition (times) | | | | 0.094 |
| 0 | 969 (17.5) | 34 (13.3) | 935 (17.7) | |
| 1 | 822 (14.8) | 29 (11.4) | 793 (15.0) | |
| 2 | 554 (10.0) | 22 (8.6) | 532 (10.0) | |

| | | | | |
|---|---|---|---|---|
| 3 | 449 (8.1) | 24 (9.4) | 425 (8.0) | |
| 4 | 2244 (40.4) | 116 (45.5) | 2128 (40.2) | |
| 5+ | 511 (9.2) | 30 (11.8) | 481 (9.1) | |
| **Exercise situation [a]** | | | | |
| Frequency (days/week) | | | | 0.290 |
| 0 | 2535 (45.7) | 130 (50.8) | 2405 (45.4) | |
| 1-3 | 957 (17.3) | 43 (16.8) | 914 (17.3) | |
| 4-6 | 683 (12.3) | 24 (9.4) | 659 (12.5) | |
| 7 | 1373 (24.8) | 59 (23.0) | 1314 (24.8) | |
| Duration (minutes) | | | | **0.019** |
| 0-10 | 2627 (47.3) | 142 (55.5) | 2485 (46.9) | |
| 11-30 | 1311 (23.6) | 57 (22.2) | 1254 (23.7) | |
| 31-60 | 1222 (22.0) | 48 (18.8) | 1174 (22.2) | |
| 60+ | 391 (7.0) | 9 (3.5) | 382 (7.2) | |
| **Douleur Neuropathique 4 score** | | | | **<0.001** |
| 0 | 4692 (84.5) | 57 (22.3) | 4635 (87.5) | |
| 1 | 405 (7.3) | 63 (24.5) | 342 (6.5) | |
| 2 | 215 (3.9) | 37 (14.5) | 178 (3.4) | |
| 3 | 105 (1.9) | 34 (13.3) | 71 (1.3) | |
| 4+ | 136 (2.5) | 65 (25.4) | 71 (1.3) | |

（四）截肢有無兩組之間臨床特徵之比較

| Variables | Total | Amputation | | *p*-value |
|---|---|---|---|---|
| | (n=5,689) | Yes (n=14) | No (n=5,675) | |
| **Hospital information** | | | | |
| Area | | | | 0.868 |
| North | 2677 (47.1) | 8 (57.2) | 2669 (47.0) | |
| Central | 1058 (18.6) | 3 (21.4) | 1055 (18.6) | |
| South | 1663 (29.2) | 3 (21.4) | 1660 (29.3) | |
| East | 291 (5.1) | 0 (0.0) | 291 (5.1) | |
| Hospital level | | | | 0.219 |
| Academic medical centers | 3017 (53.0) | 8 (57.1) | 3009 (53.0) | |
| Regional hospital | 1520 (26.7) | 6 (42.9) | 1514 (26.7) | |
| District hospital | 123 (2.2) | 0 (0.0) | 123 (2.2) | |
| Clinic | 1029 (18.1) | 0 (0.0) | 1029 (18.1) | |
| **Demography** | | | | |
| Age | 64.0 (56.0-70.0) | 57.0 (50.0-67.0) | 64.0 (56.0-70.0) | 0.092 |
| Sex | | | | 0.641 |
| Male | 2897 (50.9) | 8 (57.1) | 2889 (50.9) | |

| | | | | |
|---|---|---|---|---|
| Female | 2792 (49.1) | 6 (42.9) | 2786 (49.1) | |
| Educational level | | | | 0.101 |
| Illiterate/junior high school and below | 2867 (50.7) | 6 (42.9) | 2861 (50.7) | |
| Senior high school | 1473 (26.1) | 7 (50.0) | 1466 (26.0) | |
| College and above | 1313 (23.2) | 1 (7.1) | 1312 (23.3) | |
| Participate DSCN | | | | 1.000 |
| Yes | 5238 (92.2) | 13 (92.9) | 5225 (92.2) | |
| No | 445 (7.8) | 1 (7.1) | 444 (7.8) | |
| Cigarette smoking | | | | 0.666 |
| Non-smoker | 4171 (73.3) | 10 (71.4) | 4161 (73.3) | |
| Former smoker | 784 (13.8) | 3 (21.4) | 781 (13.8) | |
| Current smoker | 732 (12.9) | 1 (7.2) | 731 (12.9) | |
| BMI ($kg/m^2$) | | | | 0.863 |
| <18.5 | 61 (1.1) | 0 (0.0) | 61 (1.1) | |
| 18.5-24 | 1702 (29.9) | 3 (21.4) | 1699 (29.9) | |
| 24-27 | 1720 (30.2) | 5 (35.7) | 1715 (30.3) | |
| ≥ 27 | 2204 (38.8) | 6 (42.9) | 2198 (38.7) | |
| SBP (mmHg) | 132.0 (121.0-143.0) | 131.0 (122.0-143.0) | 132.0 (121.0-143.0) | 0.767 |
| DBP (mmHg) | 75.0 (68.0-82.0) | 80.0 (68.0-91.0) | 75.0 (68.0-82.0) | 0.366 |
| **Laboratory measurement** | | | | |
| A1C (%) | | | | 0.082 |
| <7 | 2529 (44.5) | 3 (21.4) | 2526 (44.6) | |
| ≥ 7 | 3155 (55.5) | 11 (78.6) | 3144 (55.4) | |
| Creatinine (mg/dL) | 0.9 (0.7-1.1) | 0.9 (0.8-1.2) | 0.9 (0.7-1.1) | 0.362 |
| TC (mg/dL) | 155.0 (136.0-176.0) | 148.0 (138.0-168.0) | 155.0 (136.0-176.0) | 0.933 |
| TG (mg/dL) | 116.0 (82.0-167.0) | 127.0 (103.0-182.0) | 116.0 (82.0-167.0) | 0.155 |
| HDL – C (mg/dL) | 46.0 (38.0-54.2) | 38.0 (31.0-47.0) | 46.0 (38.0-54.8) | **0.024** |
| LDL – C (mg/dL) | 86.0 (69.3-103.0) | 81.5 (72.0-124.0) | 86.0 (69.0-103.0) | 0.734 |
| **Medication use for diabetes (any)** | | | | 0.451 |
| Yes | 5428 (95.8) | 13 (92.9) | 5415 (95.8) | |
| No | 237 (4.2) | 1 (7.1) | 236 (4.2) | |
| Antiplatelet drugs | | | | 0.295 |
| Yes | 1019 (17.9) | 4 (28.6) | 1015 (17.9) | |
| No | 4664 (82.1) | 10 (71.4) | 4654 (82.1) | |
| Hypertension drugs | | | | 0.519 |
| Yes | 3169 (55.7) | 9 (64.3) | 3160 (55.7) | |
| No | 2516 (44.3) | 5 (35.7) | 2511 (44.3) | |
| Hyperlipidemia drugs | | | | 0.233 |
| Yes | 4111 (72.3) | 8 (57.1) | 4103 (72.3) | |

| | | | | |
|---|---|---|---|---|
| No | 1575 (27.7) | 6 (42.9) | 1569 (27.7) | |
| Diabetes oral drugs | | | | 0.618 |
| Yes | 5300 (93.2) | 14 (100) | 5286 (93.2) | |
| No | 388 (6.8) | 0 (0.0) | 388 (6.8) | |
| Insulin | | | | **0.031** |
| Yes | 1587 (28.0) | 8 (57.1) | 1579 (27.9) | |
| No | 4084 (72.0) | 6 (42.9) | 4078 (72.1) | |
| **Health education** | | | | |
| Nursing (times) | | | | 1.000 |
| 0 | 465 (8.2) | 1 (7.1) | 464 (8.2) | |
| 1-3 | 1642 (28.9) | 4 (28.6) | 1638 (28.9) | |
| 4 | 2839 (49.9) | 7 (50.0) | 2832 (49.9) | |
| 5+ | 739 (13.0) | 2 (14.3) | 737 (13.0) | |
| Nutrition (times) | | | | 0.816 |
| 0 | 1014 (17.8) | 3 (21.4) | 1011 (17.8) | |
| 1-3 | 1869 (32.9) | 4 (28.6) | 1865 (32.9) | |
| 4 | 2278 (40.1) | 5 (35.7) | 2273 (40.1) | |
| 5+ | 524 (9.2) | 2 (14.3) | 522 (9.2) | |
| **Exercise situation [a]** | | | | **0.003** |
| Yes | 2608 (45.9) | 12 (85.7) | 2596 (45.8) | |
| No | 3072 (54.1) | 2 (14.3) | 3070 (54.2) | |
| **Douleur Neuropathique 4 score** | | | | **<0.001** |
| 0 | 4799 (84.4) | 7 (50.0) | 4792 (84.4) | |
| 1-2 | 634 (11.1) | 2 (14.3) | 632 (11.2) | |
| 3 | 117 (2.1) | 2 (14.3) | 115 (2.0) | |
| 4+ | 139 (2.4) | 3 (21.4) | 136 (2.4) | |

Continuous data without normal distribution are presented as median (IQR) and performed as Wilcoxon rank sum test; Categorical data are presented as n (%) and performed by the chi-square test or Fisher's exact test, as appropriate.
DSCN, the Diabetes Shared Care Network; BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein.
[a] Moderate or vigorous physical activity

表二：
（一）足部潰瘍單變數以及多變數分析預估的勝算比

| Variables | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR (95% CI) | *p*-value | aOR (95% CI) | *p*-value |
| **Hospital information** | | | | |
| Area | | | | |
| North | Reference | | | |
| Central | 0.31 (0.09-1.04) | 0.059 | | |
| South | 1.61 (0.91-2.84) | 0.103 | | |

| | | | | |
|---|---|---|---|---|
| East | NA | - | | |
| Hospital level | | | | |
| Academic medical centers | Reference | | | |
| Regional hospital | 1.53 (0.85-2.75) | 0.156 | | |
| District hospital | NA | - | | |
| Clinic | 0.57 (0.22-1.48) | 0.244 | | |
| **Demography** | | | | |
| Age | 0.99 (0.96-1.01) | 0.250 | | |
| Sex | | | | |
| Male | 2.33 (1.27-4.26) | **0.006** | 3.22 (1.51-6.86) | **0.003** |
| Female | Reference | | Reference | |
| Educational level | | | | |
| Illiteracy | Reference | | | |
| Elementary school | 1.26 (0.29-5.52) | 0.764 | | |
| Junior high school | 1.11 (0.23-5.39) | 0.894 | | |
| Senior high school | 1.64 (0.38-7.12) | 0.511 | | |
| College and above | 1.08 (0.23-4.95) | 0.923 | | |
| Participate DSCN | 0.52 (0.23-1.17) | 0.115 | | |
| Cigarette smoking | | | | |
| Non-smoker | Reference | | | |
| Former smoker | 2.19 (1.08-4.44) | **0.029** | | |
| Current smoker | 2.76 (1.42-5.38) | **0.003** | | |
| BMI ($kg/m^2$) | | | | |
| <18.5 | NA | - | | |
| 18.5-24 | Reference | | | |
| 24-27 | 0.80 (0.38-1.67) | 0.557 | | |
| ≥ 27 | 1.07 (0.56-2.04) | 0.845 | | |
| SBP (mmHg) | 1.02 (1.00-1.03) | **0.025** | | |
| DBP (mmHg) | 1.01 (0.98-1.03) | 0.586 | | |
| **Laboratory measurement** | | | | |
| A1C ( ≥ 7% vs <7%) | 1.35 (0.77-2.39) | 0.298 | | |
| Creatinine (mg/dL) | 1.17 (1.06-1.29) | **0.002** | | |
| TC (mg/dL) | 1.00 (0.99-1.01) | 0.689 | | |
| TG (mg/dL) | 1.00 (1.00-1.00) | 0.207 | | |
| HDL – C (mg/dL) | 0.99 (0.97-1.02) | 0.561 | | |
| LDL – C (mg/dL) | 1.00 (0.99-1.01) | 0.790 | | |
| **Medication use for diabetes (any)** | 0.50 (0.18-1.4) | 0.188 | | |

| | | | | |
|---|---|---|---|---|
| Antiplatelet drugs | 0.98 (0.48-2.03) | 0.963 | | |
| Hypertension drugs | 1.75 (0.97-3.17) | 0.065 | | |
| Hyperlipidemia drugs | 0.50 (0.29-0.88) | 0.016 | | |
| Diabetes oral drugs | 0.85 (0.31-2.38) | 0.759 | | |
| Insulin | 3.07 (1.75-5.36) | **<0.001** | 2.05 (1.03-4.08) | **0.040** |
| **Health education** | | | | |
| Nursing (times) | | | | |
| 0 | Reference | | Reference | |
| 1 | 0.54 (0.19-1.53) | 0.248 | 0.97 (0.31-3.02) | 0.957 |
| 2 | 0.95 (0.37-2.41) | 0.910 | 0.79 (0.25-2.47) | 0.685 |
| 3 | 0.17 (0.04-0.80) | **0.024** | 0.11 (0.01-0.89) | **0.039** |
| 4 | 0.30 (0.13-0.68) | **0.004** | 0.31 (0.12-0.81) | **0.017** |
| 5+ | 0.55 (0.21-1.43) | 0.219 | 0.33 (0.09-1.21) | 0.094 |
| Nutrition (times) | | | | |
| 0 | Reference | | | |
| 1 | 1.22 (0.50-2.93) | 0.665 | | |
| 2 | 0.72 (0.22-2.30) | 0.576 | | |
| 3 | 0.65 (0.18-2.38) | 0.519 | | |
| 4 | 0.75 (0.34-1.64) | 0.473 | | |
| 5+ | 1.35 (0.51-3.57) | 0.545 | | |
| **Exercise situation** [a] | | | | |
| Frequency (days/week) | | | | |
| 0 | Reference | | | |
| 1-3 | 0.84 (0.41-1.71) | 0.627 | | |
| 4-6 | 0.12 (0.02-0.86) | **0.035** | | |
| 7 | 0.46 (0.21-1.00) | 0.0501 | | |
| Duration (minutes) | | | | |
| 0-10 | Reference | | | |
| 11-30 | 0.53 (0.26-1.12) | 0.095 | | |
| 31-60 | 0.19 (0.06-0.62) | **0.006** | | |
| 60+ | 1.00 (0.39-2.58) | 0.997 | | |
| **Douleur Neuropathique 4 score** | | | | |
| 0 | Reference | | Reference | |
| 1 | 2.24 (0.86-5.87) | 0.100 | 1.04 (0.24-4.52) | 0.962 |
| 2 | 2.54 (0.76-8.46) | 0.129 | 2.78 (0.80-9.66) | 0.107 |
| 3 | 8.09 (3.05-21.46) | **<0.001** | 5.10 (1.42-18.32) | **0.012** |
| 4+ | 17.02 (8.40-34.47) | **<0.001** | 14.67 (6.19-34.80) | **<0.001** |

（二）周邊血管病變單變數以及多變數分析預估的勝算比

| Variables | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR (95% CI) | *p*-value | aOR (95% CI) | *p*-value |
| **Hospital information** | | | | |
| Area | | | | |
| North | Reference | | | |
| Central | 1.40 (0.81-2.43) | 0.233 | | |
| South | 0.72 (0.39-1.32) | 0.285 | | |
| East | 0.50 (0.12-2.08) | 0.340 | | |
| Hospital level | | | | |
| Academic medical centers | Reference | | | |
| Regional hospital | 2.13 (1.23-3.71) | **0.007** | 2.13 (1.17-3.88) | **0.013** |
| District hospital | 18.01 (9.33-34.77) | **<0.001** | 28.19 (13.13-60.52) | **<0.001** |
| Clinic | 0.69 (0.28-1.69) | 0.419 | 0.80 (0.32-2.03) | 0.644 |
| **Demography** | | | | |
| Age | 1.02 (1.00-1.04) | 0.058 | | |
| Sex | | | | |
| Male | 1.12 (0.70-1.78) | 0.634 | | |
| Female | Reference | | | |
| Educational level | | | | |
| Illiteracy | Reference | | | |
| Elementary school | 0.39 (0.18-0.82) | **0.014** | | |
| Junior high school | 0.25 (0.10-0.64) | **0.004** | | |
| Senior high school | 0.36 (0.16-0.77) | **0.009** | | |
| College and above | 0.25 (0.11-0.58) | **0.001** | | |
| Participate DSCN | 0.89 (0.38-2.05) | 0.778 | | |
| Cigarette smoking | | | | |
| Non-smoker | Reference | | | |
| Former smoker | 1.02 (0.52-2.02) | 0.949 | | |
| Current smoker | 1.08 (0.55-2.14) | 0.818 | | |
| BMI ($kg/m^2$) | | | | |
| <18.5 | 1.43 (0.19-10.87) | 0.729 | | |
| 18.5-24 | Reference | | | |
| 24-27 | 1.21 (0.65-2.22) | 0.548 | | |
| ≥ 27 | 1.23 (0.69-2.20) | 0.477 | | |
| SBP (mmHg) | 1.01 (0.99-1.02) | 0.339 | | |
| DBP (mmHg) | 1.01 (0.99-1.03) | 0.539 | | |
| **Laboratory measurement** | | | | |
| A1C ( ≥ 7% vs <7%) | 1.88 (1.14-3.12) | **0.014** | | |
| Creatinine (mg/dL) | 1.12 (1.02-1.22) | **0.013** | | |
| TC (mg/dL) | 1.00 (1.00-1.01) | 0.594 | | |

| | | | | |
|---|---|---|---|---|
| TG (mg/dL) | 1.00 (1.00-1.00) | 0.528 | | |
| HDL – C (mg/dL) | 0.98 (0.96-1.00) | 0.104 | | |
| LDL – C (mg/dL) | 1.00 (0.99-1.01) | 0.808 | | |
| **Medication use for diabetes (any)** | 0.89 (0.28-2.85) | 0.842 | | |
| Antiplatelet drugs | 3.11 (1.94-5.00) | **<0.001** | 2.76 (1.62-4.69) | **<0.001** |
| Hypertension drugs | 1.45 (0.90-2.35) | 0.129 | | |
| Hyperlipidemia drugs | 1.02 (0.61-1.72) | 0.935 | | |
| Diabetes oral drugs | 1.72 (0.54-5.50) | 0.357 | | |
| Insulin | 2.01 (1.26-3.21) | **0.003** | | |
| **Health education** | | | | |
| Nursing (times) | | | | |
| 0 | Reference | | | |
| 1 | 0.61 (0.16-2.29) | 0.466 | | |
| 2 | 0.90 (0.26-3.13) | 0.867 | | |
| 3 | 0.44 (0.11-1.87) | 0.269 | | |
| 4 | 1.41 (0.56-3.57) | 0.467 | | |
| 5+ | 1.22 (0.41-3.60) | 0.717 | | |
| Nutrition (times) | | | | |
| 0 | Reference | | | |
| 1 | 0.89 (0.31-2.56) | 0.822 | | |
| 2 | 1.11 (0.36-3.40) | 0.857 | | |
| 3 | 0.28 (0.03-2.21) | 0.225 | | |
| 4 | 2.54 (1.20-5.41) | **0.015** | | |
| 5+ | 1.75 (0.63-4.86) | 0.281 | | |
| **Exercise situation [a]** | | | | |
| Frequency (days/week) | | | | |
| 0 | Reference | | | |
| 1-3 | 0.43 (0.19-0.95) | **0.037** | | |
| 4-6 | 0.25 (0.08-0.82) | **0.022** | | |
| 7 | 0.79 (0.46-1.36) | 0.400 | | |
| Duration (minutes) | | | | |
| 0-10 | Reference | | | |
| 11-30 | 0.54 (0.28-1.02) | 0.058 | | |
| 31-60 | 0.62 (0.33-1.16) | 0.133 | | |
| 60+ | 0.44 (0.14-1.44) | 0.176 | | |
| **Douleur Neuropathique 4 score** | | | | |
| 0 | Reference | | | |
| 1 | 5.54 (2.85-10.79) | **<0.001** | 5.21 (2.53-10.75) | **<0.001** |
| 2 | 3.99 (1.52-10.43) | **0.005** | 4.34 (1.46-12.91) | **0.008** |
| 3 | 13.20 (5.87-29.68) | **<0.001** | 13.91 (5.53-34.96) | **<0.001** |
| 4+ | 29.02 (15.72-53.57) | **<0.001** | 38.48 (19.53-75.81) | **<0.001** |

（三）周邊神經病變單變數以及多變數分析預估的勝算比

| Variables | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR (95% CI) | p-value | aOR (95% CI) | *p*-value |
| **Hospital information** | | | | |
| Area | | | | |
| North | Reference | | Reference | |
| Central | 0.94 (0.66-1.35) | 0.738 | 1.17 (0.72-1.90) | 0.519 |
| South | 1.02 (0.75-1.38) | 0.921 | 1.13 (0.76-1.70) | 0.543 |
| East | 2.33 (1.51-3.6) | **<0.001** | 4.58 (2.46-8.54) | **<0.001** |
| Hospital level | | | | |
| Academic medical centers | Reference | | Reference | |
| Regional hospital | 1.95 (1.48-2.57) | **<0.001** | 2.52 (1.73-3.69) | **<0.001** |
| District hospital | 2.35 (1.19-4.61) | **0.013** | 4.38 (1.84-10.45) | **<0.001** |
| Clinic | 0.82 (0.55-1.23) | 0.344 | 0.52 (0.30-0.88) | **0.015** |
| **Demography** | | | | |
| Age | 1.02 (1.01-1.03) | **<0.001** | | |
| Sex | | | | |
| Male | 1.09 (0.85-1.40) | 0.500 | | |
| Female | Reference | | | |
| Educational level | | | | |
| Illiteracy | Reference | | | |
| Elementary school | 0.83 (0.50-1.36) | 0.461 | | |
| Junior high school | 0.65 (0.38-1.14) | 0.132 | | |
| Senior high school | 0.53 (0.31-0.89) | **0.017** | | |
| College and above | 0.34 (0.20-0.61) | **<0.001** | | |
| Participate DSCN | 0.98 (0.61-1.59) | 0.948 | 0.45 (0.23-0.89) | **0.022** |
| Cigarette smoking | | | | |
| Non-smoker | Reference | | | |
| Former smoker | 1.32 (0.94-1.85) | 0.109 | | |
| Current smoker | 1.01 (0.69-1.48) | 0.961 | | |
| BMI ($kg/m^2$) | | | | |
| <18.5 | 2.48 (1.03-5.95) | **0.042** | | |
| 18.5-24 | Reference | | | |
| 24-27 | 1.08 (0.78-1.51) | 0.634 | | |
| ≥ 27 | 1.15 (0.84-1.57) | 0.386 | | |
| SBP (mmHg) | 1.00 (1.00-1.01) | 0.301 | | |
| DBP (mmHg) | 0.99 (0.98-1.00) | 0.069 | | |
| **Laboratory measurement** | | | | |
| A1C ( ≥ 7% vs <7%) | 1.38 (1.07-1.79) | **0.014** | | |
| Creatinine (mg/dL) | 1.14 (1.05-1.23) | **0.001** | | |
| TC (mg/dL) | 1.00 (0.99-1.00) | 0.307 | | |

| | | | | |
|---|---|---|---|---|
| TG (mg/dL) | 1.00 (1.00-1.00) | 0.232 | | |
| HDL – C (mg/dL) | 0.99 (0.98-1.00) | **0.047** | | |
| LDL – C (mg/dL) | 1.00 (0.99-1.00) | 0.067 | | |
| **Medication use for diabetes (any)** | 0.65 (0.38-1.12) | 0.122 | | |
| Antiplatelet drugs | 1.65 (1.23-2.21) | **<0.001** | | |
| Hypertension drugs | 1.56 (1.19-2.02) | **0.001** | 1.42 (1.03-1.95) | **0.032** |
| Hyperlipidemia drugs | 1.06 (0.80-1.41) | 0.679 | | |
| Diabetes oral drugs | 0.55 (0.37-0.83) | **0.004** | | |
| Insulin | 2.18 (1.69-2.81) | **<0.001** | 1.65 (1.20-2.25) | **0.002** |
| **Health education** | | | | |
| Nursing (times) | | | | |
| 0 | Reference | | | |
| 1 | 0.68 (0.35-1.29) | 0.237 | | |
| 2 | 0.93 (0.49-1.73) | 0.808 | | |
| 3 | 0.90 (0.49-1.64) | 0.722 | | |
| 4 | 1.01 (0.62-1.63) | 0.976 | | |
| 5+ | 1.09 (0.63-1.91) | 0.752 | | |
| Nutrition (times) | | | | |
| 0 | Reference | | Reference | |
| 1 | 1.01 (0.61-1.67) | 0.982 | 1.96 (1.02-3.76) | **0.043** |
| 2 | 1.14 (0.66-1.96) | 0.645 | 2.66 (1.29-5.48) | **0.008** |
| 3 | 1.55 (0.91-2.65) | 0.107 | 3.00 (1.49-6.07) | **0.002** |
| 4 | 1.50 (1.02-2.21) | **0.042** | 1.65 (0.95-2.87) | 0.073 |
| 5+ | 1.72 (1.04-2.84) | **0.036** | 2.58 (1.28-5.21) | **0.008** |
| **Exercise situation [a]** | | | | |
| Frequency (days/week) | | | | |
| 0 | Reference | | | |
| 1-3 | 0.87 (0.61-1.24) | 0.441 | | |
| 4-6 | 0.67 (0.43-1.05) | 0.082 | | |
| 7 | 0.83 (0.61-1.14) | 0.248 | | |
| Duration (minutes) | | | | |
| 0-10 | Reference | | | |
| 11-30 | 0.80 (0.58-1.09) | 0.154 | | |
| 31-60 | 0.72 (0.51-1.00) | **0.049** | | |
| 60+ | 0.41 (0.21-0.82) | **0.011** | | |
| **Douleur Neuropathique 4 score** | | | | |
| 0 | Reference | | Reference | |
| 1 | 14.98 (10.30-21.79) | **<0.001** | 17.62 (11.71-26.53) | **<0.001** |
| 2 | 16.90 (10.89-26.25) | **<0.001** | 15.83 (9.70-25.84) | **<0.001** |
| 3 | 38.94 (23.97-63.25) | **<0.001** | 35.52 (20.37-61.92) | **<0.001** |
| 4+ | 74.44 (48.62-113.97) | **<0.001** | 82.80 (50.83-134.89) | **<0.001** |

（四）截肢單變數以及多變數分析預估的勝算比

| Variables | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR (95% CI) | *p*-value | aOR (95% CI) | *p*-value |
| **Hospital information** | | | | |
| Area | | | | |
| North | Reference | | | |
| Central | 1.01 (0.74-1.37) | 0.962 | | |
| South | 0.80 (0.60-1.07) | 0.129 | | |
| East | 1.44 (0.91-2.28) | 0.117 | | |
| Hospital level | | | | |
| Academic medical centers | Reference | | | |
| Regional hospital | 1.06 (0.82-1.38) | 0.645 | | |
| District hospital | 2.27 (1.29-3.98) | **0.004** | | |
| Clinic | 0.45 (0.30-0.69) | **<0.001** | | |
| **Demography** | | | | |
| Age | 1.04 (1.03-1.05) | **<0.001** | 0.96 (0.92-0.99) | **0.047** |
| Sex | | | | |
| Male | 1.47 (1.17-1.86) | **0.001** | | |
| Female | Reference | | | |
| Educational level | | | | |
| Illiterate/junior high school and below | Reference | | | |
| Senior high school | 2.28 (0.76-6.79) | 0.140 | | |
| College and above | 0.36 (0.04-3.02) | 0.349 | | |
| Participate DSCN | 0.69 (0.48-1.01) | 0.057 | | |
| Cigarette smoking | | | | |
| Non-smoker | Reference | | | |
| Former smoker | 1.91 (1.44-2.52) | **<0.001** | | |
| Current smoker | 0.79 (0.53-1.17) | 0.243 | | |
| BMI (kg/m2) | | | | |
| <18.5 | 0.99 (0.30-3.23) | 0.987 | | |
| 18.5-24 | Reference | | | |
| 24-27 | 1.11 (0.82-1.50) | 0.504 | | |
| ≥ 27 | 1.13 (0.85-1.50) | 0.402 | | |
| SBP (mmHg) | 0.99 (0.99-1.00) | 0.097 | | |
| DBP (mmHg) | 0.97 (0.96-0.98) | **<0.001** | | |
| **Laboratory measurement** | | | | |
| A1C ( ≥ 7% vs <7%) | 1.19 (0.94-1.51) | 0.141 | | |
| Creatinine (mg/dL) | 1.12 (1.04-1.20) | **0.004** | | |
| TC (mg/dL) | 0.99 (0.99-0.99) | **<0.001** | | |
| TG (mg/dL) | 1.00 (1.00-1.00) | 0.294 | | |

| | | | | |
|---|---|---|---|---|
| HDL – C (mg/dL) | 0.98 (0.97-0.99) | **<0.001** | | |
| LDL – C (mg/dL) | 0.99 (0.99-1.00) | **<0.001** | | |
| **Medication use for diabetes (any)** | 0.64 (0.39-1.03) | 0.066 | | |
| Antiplatelet drugs | 8.24 (6.48-10.48) | **<0.001** | | |
| Hypertension drugs | 3.02 (2.29-3.98) | **<0.001** | | |
| Hyperlipidemia drugs | 1.47 (1.11-1.95) | **0.007** | | |
| Diabetes oral drugs | 0.71 (0.48-1.07) | 0.103 | | |
| Insulin | 1.56 (1.23-1.98) | **<0.001** | | |
| **Health education** | | | | |
| Nursing (times) | | | | |
| 0 | Reference | | | |
| 1-3 | 1.13 (0.13-10.16) | 0.911 | | |
| 4 | 1.15 (0.14-9.34) | 0.898 | | |
| 5+ | 1.26 (0.11-13.92) | 0.851 | | |
| Nutrition (times) | | | | |
| 0 | Reference | | | |
| 1-3 | 0.72 (0.16-3.24) | 0.671 | | |
| 4 | 0.74 (0.18-3.11) | 0.682 | | |
| 5+ | 1.29 (0.22-7.75) | 0.780 | | |
| **Exercise situation** [a] | | | | |
| Yes | 0.14 (0.03-0.63) | **0.010** | 0.19 (0.04-0.86) | **0.031** |
| No | Reference | | Reference | |
| **Douleur Neuropathique 4 score** | | | | |
| 0 | Reference | | Reference | |
| 1-2 | 2.17 (0.45-10.45) | 0.336 | 2.38 (0.48-11.87) | 0.289 |
| 3 | 11.91 (2.45-57.93) | **0.002** | 7.45 (0.08-63.41) | 0.066 |
| 4+ | 15.10 (3.86-59.03) | **<0.001** | 16.83 (4.06-69.73) | **<0.001** |

DSCN, the Diabetes Shared Care Network; BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein.
NA: not available, means no event occurred.
[a] Moderate or vigorous physical activity.

率高達 21.3%[5]。之所以會有這種差別可能與收案的對象有關。雖然本研究中與過去研究收案的平均年齡相似，但是我們發現地區以及醫院層級皆與糖尿病神經病變的風險有關，可能是此原因導致盛行率不同，另外在周邊神經病變的診斷標準不同也可能導致此差異。撇除盛行率的部份，我們發現患有糖尿病神經病變的人年紀較大、肌酸酐較高、以及糖化血紅素較高 (A1C ≥ 7%)。此外，胰島素、高血壓用藥以及抗血小板藥物使用比率也較高，這些皆與過去的研究結果相似[5,6]。

關於周邊動脈血管疾病，本研究的盛行率為 1.33% (73 人 )，與 10 年前一個收錄醫院病人的研究相比盛行率 (10.0%) 低[7]。在一些社區的研究發現盛行率大概落在 4.3%~9% 之間，而在醫院的研究中盛行率會較高[8]，而作者也提到，不同的診斷方法以及工具都會影響到最終盛行率的結果[8]。我們的研究主要是藉由問卷的方式得知病人是否有此病況，但部分病人可能沒症狀所以不知道已經罹患周邊動脈血管疾病，這也許是導致本研究中盛行率比較低的原因。過去研究發現年齡、較低的身體質量指數、血壓以及胰島素使用為周邊動脈血管疾病的危險因子[7]。在我們的研究中發現，血糖控制不佳、肌酸酐較高、使用胰島素及抗血小板藥物都是周邊動脈血管疾病的危險因子，但與年齡、身體質量指數以及血壓與並沒有相關。

而在足部潰瘍的部分，本研究中盛行率約為 0.9% (51 人 )。在過去一系統性回顧研究中，全球的盛行率約為 6.3%，而在北美、亞洲、歐洲、非洲及大洋洲分別是 13.0%、5.5%、5.1%、7.2% 以及 3.0%[9]。過去台灣健保資料庫的研究也顯示，在 2001 年到 2015 年間，足部潰瘍的盛行率約為 0.5~0.8%10，與我們的研究相近。台灣的糖尿病足部潰瘍似乎比起其他國家來說較少見。我們也發現足部潰瘍者男性、曾經抽菸者或正在抽菸者、使用胰島素、肌酸酐較高以及收縮壓較高比例較多，這也與之前的研究相似[10]。

至於截肢的部分，在我們的族群中盛行率約為 0.2%。相較於之前日本的研究發現年紀大是截肢的危險因子[11]，在我們研究中，多變數分析的結果發現年紀大者截肢的勝算比比較低。另外，截肢者高密度脂蛋白較低且有較高的比例使用胰島素。先前利用電訪調查台灣 1995 到 2002 的第 2 型糖尿病截肢的研究發現，約有 0.8% 的人是有截肢的[11]，我們推測也許在本研究中截肢的比例較低應該與研究的時間不同有關，因為台灣在 2001 年開始推行糖尿病共同照護網計畫，而研究中發現有加入計畫的病人比沒加入計畫的截肢風險相比較低[12]。而因為我們大部分的病人都是有加入糖尿病共同照護計畫，據此推論本研究的盛行率降低應屬合理。

雖然我們發現糖尿病控制不好與周邊動脈血管疾病和周邊神經病變有相關，但有趣的是，足部潰瘍甚至截肢與血糖控制不佳卻沒有相關，即便它們的致病機轉也是來自於周邊動脈血管疾病和周邊神經病變。同樣地，最近的整合分析中也發現糖化血色素的高低並不會影響糖尿病潰瘍病人的截肢率[13]。然而日本的研究則發現糖化血色素大於 8% 的病人有較高的截肢率[14]。這其中的差異可能是因為我們的研究跟日本的研究對於血糖控制的糖化血色素切點不同而導致。從我們的研究看來嚴格控制糖化血色素在 7% 以下可以降低周邊動脈血管疾病和周邊神經病變的發生，但是也許無法預防足部潰瘍跟截肢。或許有其他比起血糖控制更重要的因素會影響足部潰瘍或是截肢的發生，未來需要更多的研究來證明。

在年紀的部分，老化是動脈粥狀硬化的危險因子[15]，跟心血管疾病有關，在過去的研究也認為年齡越大周邊動脈血管疾病的盛行率越高[16]。在我們的研究中雖然年齡與周邊動脈血管疾病的關係沒有達到統計意義，但也發現有周邊動脈血管疾病組別平均年齡較高（66 歲比 64 歲），也許需要更多的樣本數來確認這兩者的關係。另外，年齡跟足部潰瘍無關，這跟過去研究是一致的[17]，雖然也有一些研究顯示有足部潰瘍的人年齡層較高[9]，因此仍需有更多的研究來驗證兩者的關係。比較特別的是，我們的研究中發現年紀大的人有較小的機會截

肢，這與過去的研究結果並不一致。雖然過去系統性文獻回顧指出截肢與年紀無關[13]，但日本跟瑞典的研究卻顯示年紀越大截肢的風險越高[14,18]。而另一篇利用台灣健保資料庫的研究則發現，年紀輕的女性（尤其是 45 到 54 歲之間）截肢的風險比較高[19]。由於年紀大的病人截肢後死亡風險大於年紀較小的人[20]，而我們收案的對象為在門診固定追蹤且願意簽署同意書的病人，也可能因此導致年紀比較大狀況比較差的人較少進入收案，進而導致研究結果的異差。上述推論可能需要更多的研究來證實。

我們的研究中使用胰島素的病人有比較高的機會罹患周邊神經病變、周邊動脈血管疾病、足部潰瘍甚至是截肢，這與先前的研究結果一致[20,21]，但其中詳細的機轉還不清楚。雖然本研究是橫斷面的研究而無法推測胰島素治療與風險增加的因果關係，但因目前沒有證據顯示胰島素治療會直接導致這些併發症，比較合理的解釋是是這些病人通常都是糖尿病罹病較久、血糖控制不佳、較多併發症，因而合併使用胰島素治療。

雖然這四種糖尿病足部病變的疾病息息相關，但是每種疾病各有不同的危險因子，也反映了這四種疾病多元的致病機轉。本研究的限制如下。首先，本研究是一個橫斷面研究因此無法推論出因果關係或是否有干擾因子影響，但分析危險因子確實可以讓我們了解臨床上病人是否屬於高風險族群而特別加以注意。其次，我們的研究對象來自健康促進機構收案，因此並不能代表整體族群的全貌。此外，由於本研究是使用問卷填寫來獲得有部分疾病之資訊，推測應會低估實際上的盛行率。

## 結　論

本研究分析了台灣健康促進機構第 2 型糖尿病病人糖尿病相關足部病變的盛行率和風險因子。整體來說，2018 年台灣糖尿病周邊神經病變、動脈血管疾病、足部潰瘍以及截肢的盛行率比過去其他地區的研究還低，而疾病的危險因子大致上是相似的。

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# 2018 Survey on the Quality of Diabetes Care at Diabetes Health Promotion Institutes in Taiwan-Diabetes Associated Foot Complications Epidemiology and Risk Factors Study

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Diabetic foot ulcers are one of serious diabetes complications which major contributing causes were peripheral neuropathy and peripheral arterial diseases. Also, diabetes is an important cause of nontraumatic lower limb amputations. It is important to find how to avoid subsequent complications by knowing current prevalence of these diseases and the possible risk factors in patients with type 2 diabetes (T2D) in Taiwan. Our study is the first cross-sectional study to survey the diabetes related foot complications in health promotion institutes in Taiwan. Questionnaires were used to collect associated data. Totally, 5720 T2D patients were enrolled in this study. The prevalence of foot ulcers, peripheral arterial diseases, peripheral neuropathy and amputation were 0.9 %, 1.33 %, 4.6 % and 0.2%, respectively. Most of the patients came from north Taiwan and medical centers and were non-smokers. After comparing our data with previous epidemiology studies, we found that the prevalence of diabetic foot ulcers, peripheral neuropathy, peripheral arterial diseases and amputation were lower than previous studies. However, the risk factors were similar.