# I feel good but data said no! Misperception among rural diabetic residents

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# This study is part of

The multidisciplinary approach on **diabetic foot prevention** among community diabetic residents around Chiayi County— leading by nursing facilities

Funding by

National Science Council (2009~2012)

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Chang Gung Memorial Hospital (2009~2012)

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# Multidisciplinary Research / Service Team

## Chang Gung Memorial Hospital
Metabolism Endocrinology: Yun-Shing Peng & Jui-Chu Huang, MD
Cardiology: Ming-Shyan Lin, MD

## Chang Gung University of Science and Technology
Faculty:  Su-Er Guo, RN, PhD;
                 Chia-Hao Chang, Statistician, PhD & Chia-Mou Lee, RN, BSN
Research Assistants: 20 senior nursing students

## Local Health Centers -56 nurses
Public health nurses (3 x 18 townships)
Chiayi County Health Bureau (2 officers)

## Local Volunteers -36 volunteers
volunteers(2 x 18 townships)

# Conceptual framework

**Assessment**  **Intervention**  **Evaluation**

1. **Foot self-care**

2. **Neurovascularlo-pathy**

3. **Diabetes control**

4. **Identify health problems and set priorities**

1. **Primary health care**
2. **Individualized medical counseling**
3. **Standardized care**
   (**face to face, home visiting, home phone counseling**)
4. **Health promoting counseling**
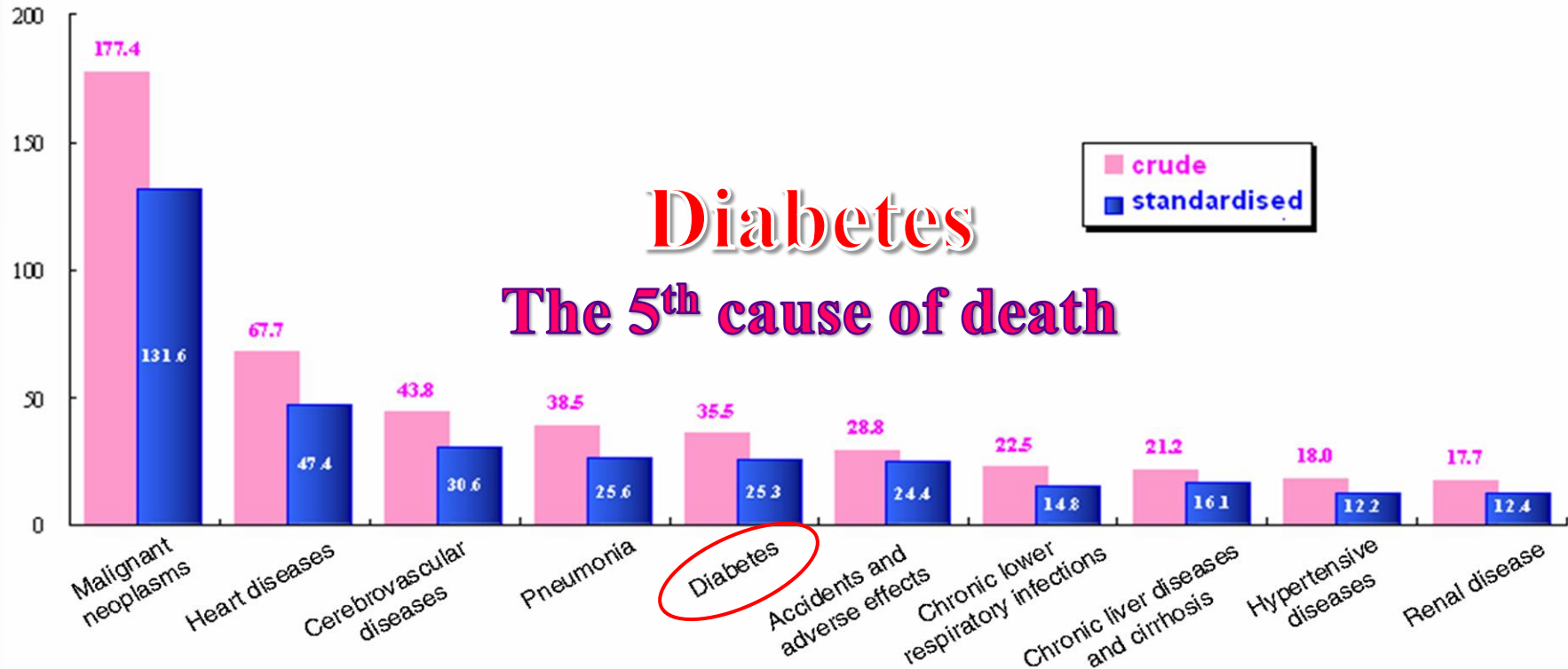   (**exercise,, diet, stress, health– responsibility**)

1. **Foot self-care ↑**

2. **DM control ↑**

3. **DM foot amputation ↓**

4. **Health status ↑**

5. **Depression ↓**

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# Background-1



mortality rate per 100,000 population

**The 10 Leading Causes of Death in Taiwan**

**Diabetes**

**The 5th cause of death**

crude
standardised

| | Malignant neoplasms | Heart diseases | Cerebrovascular diseases | Pneumonia | Diabetes | Accidents and adverse effects | Chronic lower respiratory infections | Chronic liver diseases and cirrhosis | Hypertensive diseases | Renal disease |
|---|---|---|---|---|---|---|---|---|---|---|
| crude | 177.4 | 67.7 | 43.8 | 38.5 | 35.5 | 28.8 | 22.5 | 21.2 | 18.0 | 17.7 |
| standardised | 131.6 | 47.4 | 30.6 | 25.6 | 25.3 | 24.4 | 14.8 | 16.1 | 12.2 | 12.4 |

Note: The standardised mortality rate is based on 2000 W.H.O. world standard population.

# Background-2

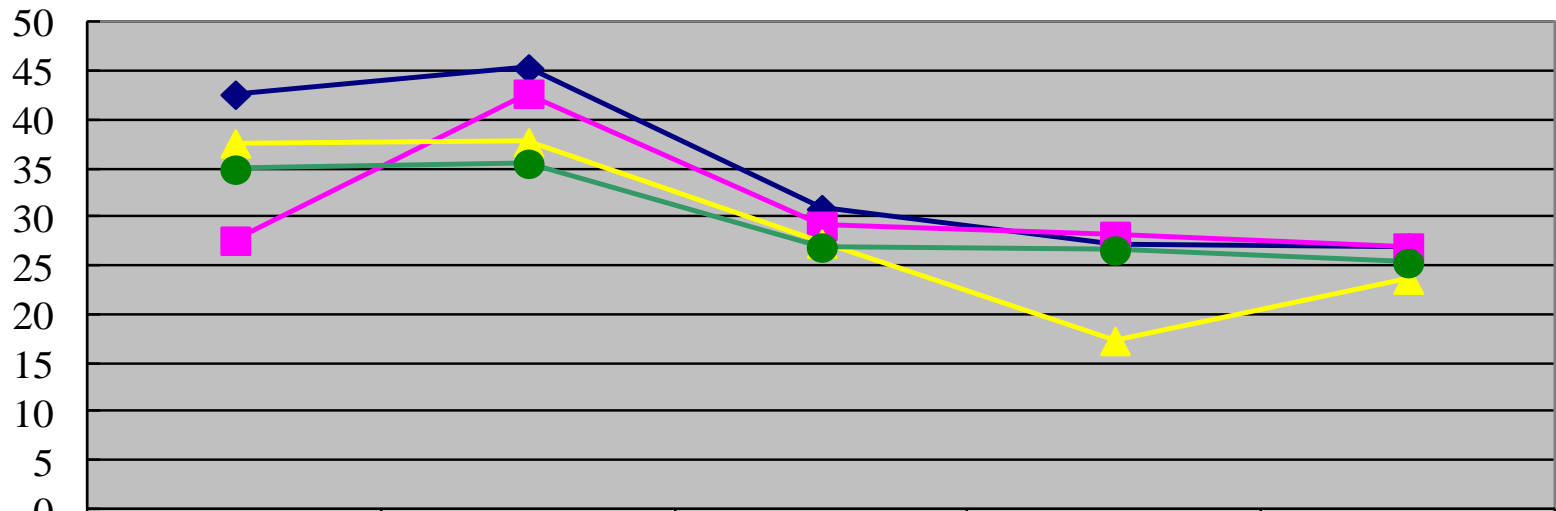## Comparison of Diabetes Mortality Rates among Rural Regions and the Nationwide (2006-2010)
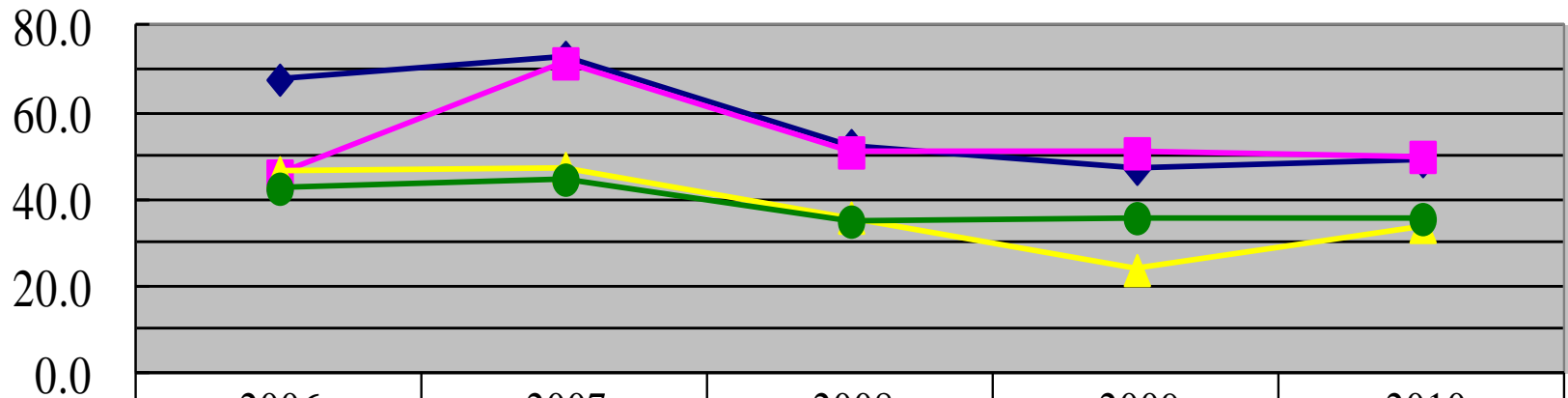
|  | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Yunlin County | 67.7 | 73.0 | 52.6 | 47.1 | 48.9 |
| Chiayi County | 45.6 | 71.5 | 50.9 | 50.7 | 49.9 |
| Chiayi City | 46.3 | 47.3 | 35.8 | 23.7 | 33.7 |
| Nationwide | 42.5 | 44.6 | 34.9 | 35.7 | 35.5 |

# Background -3

## Comparison of Diabetes Mortality Rates among Rural Regions and the Nationwide (2006-2010)

| | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Yunlin County | 42.6 | 45.3 | 30.8 | 27.2 | 26.9 |
| Chiayi County | 27.6 | 42.7 | 29.1 | 28.1 | 26.9 |
| Chiayi City | 37.6 | 37.7 | 27.3 | 17.3 | 23.6 |
| Nationwide | 34.9 | 35.5 | 26.9 | 26.6 | 25.3 |

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圖一　台灣地區各縣市97至99年18歲以上過重及肥胖盛行率
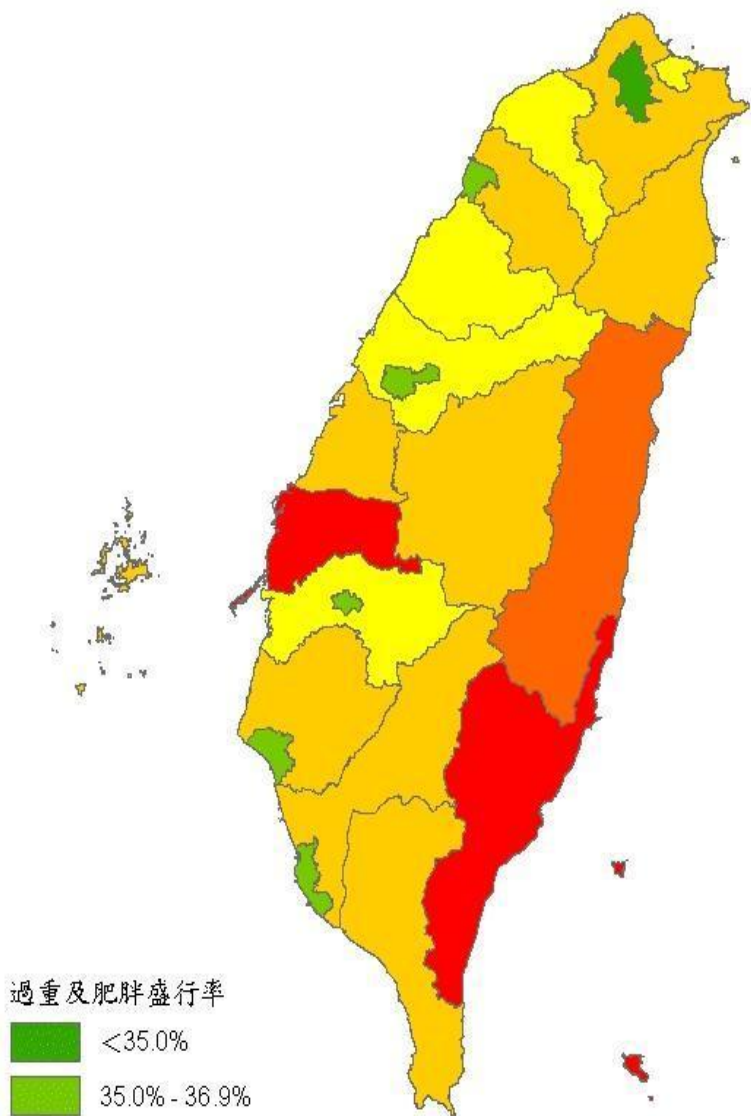
| | (%) |
|---|---|
| 總計 | 38.4 |
| 台東縣 | 46.0 |
| 雲林縣 | 43.9 |
| 花蓮縣 | 41.7 |
| 台南縣 | 40.7 |
| 屏東縣 | 40.4 |
| 高雄縣 | 40.4 |
| 彰化縣 | 40.2 |
| 南投縣 | 39.7 |
| 台北縣 | 39.5 |
| 澎湖縣 | 39.3 |
| 宜蘭縣 | 39.2 |
| 新竹縣 | 39.0 |
| 苗栗縣 | 38.9 |
| 台中縣 | 38.3 |
| 基隆市 | 38.3 |
| 桃園縣 | 38.2 |
| 嘉義縣 | 38.2 |
| 高雄市 | 36.9 |
| 台南市 | 36.3 |
| 嘉義市 | 36.3 |
| 台中市 | 36.1 |
| 新竹市 | 35.7 |
| 台北市 | 32.9 |

過重及肥胖盛行率
- <35.0%
- 35.0% - 36.9%
- 37.0% - 38.9%
- 39.0% - 40.9%
- 41.0% - 42.9%
- ≧43.0%

# Background -4

High prevalence of obesity, cancer and diabetes around Chiayi and Yunlin County

Most of the chronic diseases are related to unhealthy lifestyles (WHO, 2006)

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圖12. 民國99年糖尿病縣市地圖
（ICD 10：E10 - E14）全國：35.5 ‰₀₀₀

每十萬人口死亡率
- 20.1 - 29.6
- 29.7 - 36.9
- 37.0 - 42.4
- 42.5 - 49.9
- 50.0 - 58.0
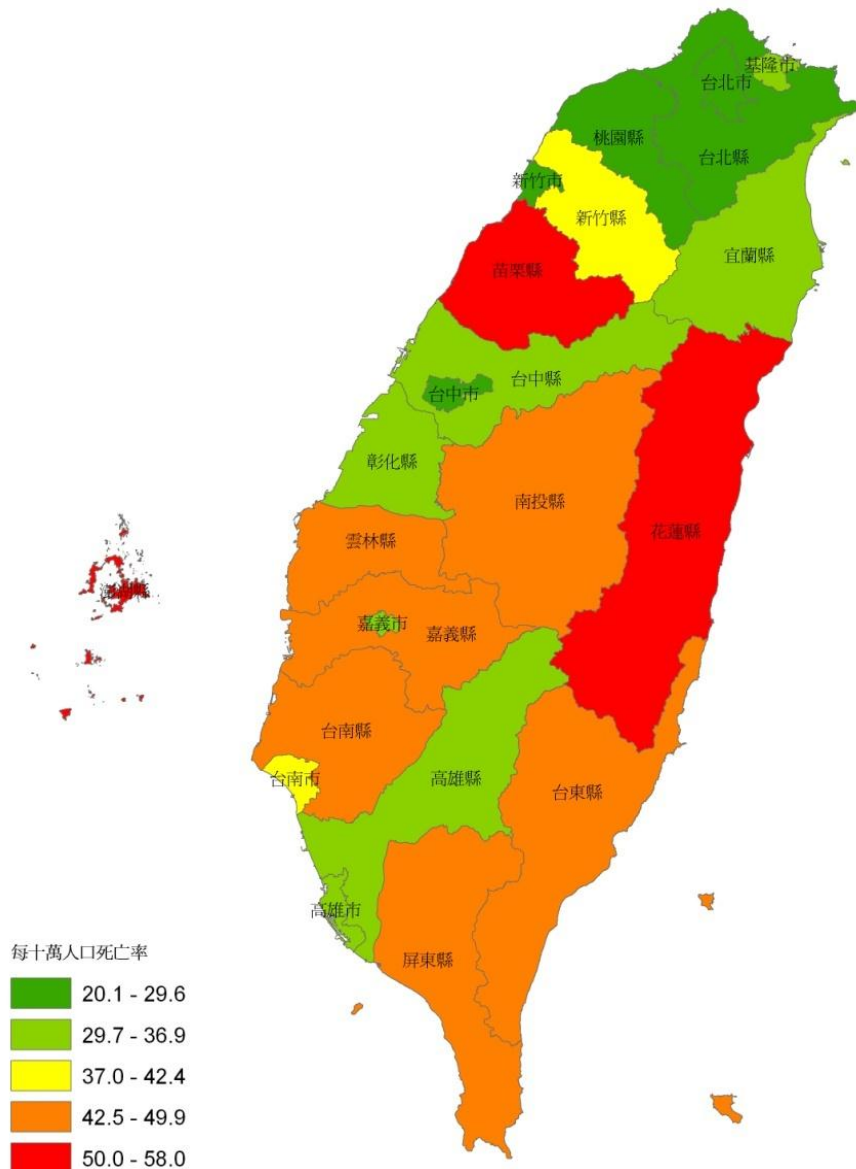
# Background -5

The current condition of diabetes mortality rates in Taiwan.

# Background -6



| | Taiwan | Japan | US | Germany | England | Singapore | South Korea |
|---|---|---|---|---|---|---|---|
| 2005 | | | 16.6 | | | | |
| 2006 | 34.9 | 4.5 | | 11.5 | 5.3 | 13.4 | 21.8 |

Legend: 2005, 2006
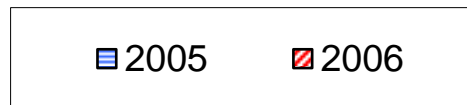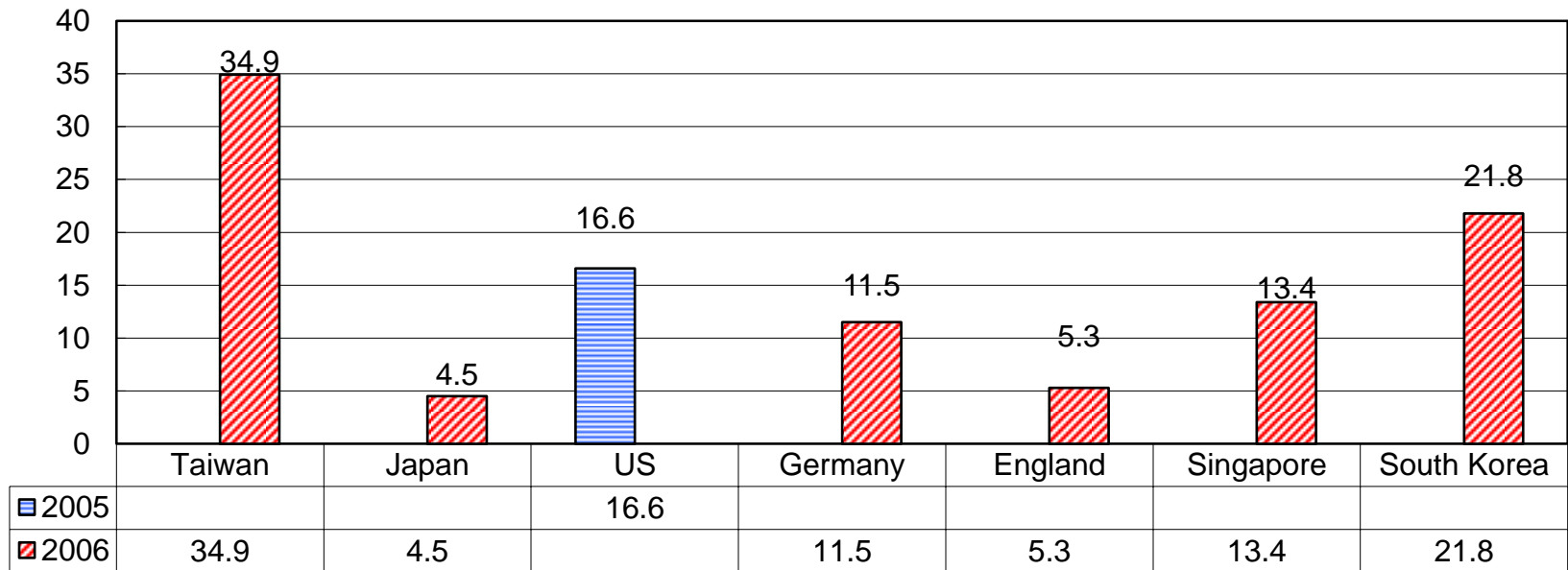
# What we do in communities...

Wh

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# 糖尿病照護下鄉 搶救免截肢

## 嘉縣衛局首創 長庚到9鄉鎮市衛所 動用精密儀器檢測 一發現病情惡化即轉診

【記者黃煌權／嘉義報導】嘉義縣衛生局結合長庚醫院，下鄉辦理糖尿病照護，先從海線9鄉鎮市辦理。長庚醫院動用精密檢測儀器到衛生所為糖尿病患做血管評估，一旦發現病情惡化，馬上轉介到醫院治療，讓不少糖尿病患免於截肢，深獲病患及家屬肯定。衛生局強調，這是全國首創。

衛生局長鍾明昌指出，嘉義縣去年每10萬人約有50.9人死於糖尿病，因糖尿病截肢的人也不少。

鍾明昌說，衛生局結合長庚技術學院嘉義分部護理研究所所長陳美燕、嘉義長庚醫院整型外科主任黃維超、新陳代謝科主彭雲杏等人，到沿海9鄉鎮市，辦理社區糖尿病照護計畫。

昨天在布袋鎮衛生所，衛生局從複合式篩檢，找到34名糖尿病患接受追蹤、檢查，嘉義長庚醫院也動用「踝動脈與肱動脈」檢測儀，精準檢測病患手、足部的血壓，檢查規格視同大型醫院。

黃維超指出，嘉義縣農、漁民比率很高，一旦截肢，等同斷了生計；許多罹患糖尿病的老人不懂自我管理，截肢風險偏高。

鍾明昌表示，沿海9鄉鎮市有388名糖尿病患要接受追蹤檢查，已辦理過的鄉鎮市有新港、朴子及布袋。未來，將與大林慈濟醫院在山區舉辦。



嘉義縣衛生局與長庚醫院，昨天在布袋鎮衛生所為糖尿病患提供各項檢查及病情檢測，深獲患及家屬肯定。
記者黃煌權／攝影

# The Study –

The **"feel good"** perception can help people to deal with stress and promote psychological well-being, since **depression** is associated with poor physical functioning, poorer adherence to exercise regimens and a healthy diet, and abnormal $HbA_1c$ levels.

# Aim

To assess **the self-perception** of diabetes control in relation to taking exercise and adopting a healthy diet among rural diabetic residents

# Design and Participants

○ **Design:**

A cross-sectional study design was applied in nine west coast and nine inland regions from January 1, 2009 to June 30, 2010.

○ **Participants:**

- Participants were recruited from 18 rural community diabetic residents
- Simple random sampling from their local DM registration files was used by public health nurses in each of the 18 districts.

July 30, 2012

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# Data Collection

1. **Perception of diabetes control:**

"During recent months, how do you feel/think about your diabetes control?"

⟶(A) feel good; (B) don't feel bad/feel ok; (C) don't feel good; (D) feel bad/don't know

2. **Physiological indicators:**

Fasting blood glucose (FBG), HbA1C, total cholesterol (TC), triglyceride (TG) & low density lipoprotein cholesterol (LDL)

3. **Health-promoting behavior**

"How often do you adopt the diabetes diet or balanced diet as part of your diabetes daily treatment? "

"How often do you practice regular exercise (20-30 minutes a day, at least 3 times a week, or 150 minutes a week) as part of your diabetes treatment in a week?"

→ often (usually/always)

→ not often (never/sometimes)

Association between the demographic characteristics and perceptions of diabetes control

(N=715)

| Variables | Perception of diabetes control | | | $\chi 2/ F$ | $p$ |
|---|---|---|---|---|---|
| | Feel good | Feel not bad | Feel bad | | |
| Duration of diabetes years | 8.5 (7.4) | 8.9 (6.5) | 10.1 (6.8) | 2.40 | 0.085 |
| Age (years)[a] | 70.2 (8.8) | 68.5 (9.6) | 65.8 (11.7) | 8.33 | 0.000 |
| Gender | | | | | |
| Female | 108 (52.7) | 213 (57.3) | 90 (65.2) | 5.32 | 0.070 |
| Male | 97 (47.3) | 159 (42.7) | 48 (34.8) | | |
| Educational level | | | | | |
| ≦ primary school | 155 (78.3) | 287 (78.4) | 100 (76.3) | 0.26 | 0.859 |
| ≧ secondary school | 43(21.7) | 79 (21.6) | 31 (23.7) | | |
| Marital status | | | | | |
| Married | 163 (79.5) | 304 (81.7) | 111 (80.4) | 0.43 | 0.805 |
| Others (single, divorce, widow) | 42 (20.5) | 68 (18.3) | 27 (19.6) | | |
| Types of treatment | | | | | |
| None | 14 ( 6.8) | 17 ( 4.6) | 5 ( 3.7) | 16.12 | 0.013 |
| OAD only[b] | 182 (88.8) | 335 (90.1) | 113 (84.3) | | |
| Insulin only | 4 ( 2.0) | 6 ( 1.6) | 10 ( 7.5)[c] | | |
| Insulin and combined OAD | 5 ( 2.4) | 14 ( 3.8) | 6 ( 4.5) | | |
| Treatment agency | | | | | |
| Local health center | 146 (71.2) | 242 (65.1) | 95 (68.8) | 2.42 | 0.298 |
| Clinics (hospital) | 59 (28.8) | 130 (34.9) | 43 (31.2) | | |
| Compliance to treatment | | | | | |
| Regular | 190 (92.7) | 344 (93.0) | 118 (89.4) | 1.82 | 0.402 |
| Irregular | 15 ( 7.3) | 26 ( 7.0) | 14 (10.6) | | |

[a]Age: multiple comparison (feel good>feel bad, feel not bad>feel bad

[b]OAD: oral antidiabetic drugs

[c] Adjusted Residual=3.6

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

**Relationship between physiological indicators, practicing health-related behaviors and perceptions of diabetes control**

| Variables | Perception of diabetes control | | | $\chi 2$ | $p$ |
|---|---|---|---|---|---|
| | Feel good | Feel not bad | Feel bad | | |
| Fasting blood sugar (mg/dl) | | | | 67.88 | 0.000 |
| <130 | 126 (63.0) | 142 (41.4) | 21 (16.8) | | |
| ≥131 | 74 (37.0) | 201 (58.6) | 104 (83.2) | | |
| HbA1C (%) | | | | 46.32 | 0.000 |
| < 7.0 | 82 (45.3) | 87 (28.6) | 10 ( 8.5) | | |
| ≥7.0 | 99 (54.7) | 217 (71.4) | 107 (91.5) | | |
| Total cholesterol (mg/dl) | | | | 0.32 | 0.853 |
| <175 | 135 (72.6) | 212 (70.2) | 82 (71.3) | | |
| ≥176 | 51(27.4) | 90 (29.8) | 33 (28.7) | | |
| Triglyceride (mg/dl) | | | | 9.07 | 0.010 |
| <150 | 74 (43.3) | 83 (29.7) | 34 (31.5) | | |
| ≥151 | 97 (56.7) | 196 (70.3) | 74 (68.5) | | |
| LDL (mg/dl) | | | | 2.00 | 0.368 |
| <100 | 58 (37.4) | 70 (30.6) | 29 (32.2) | | |
| ≥101 | 97 (62.6) | 159 (69.4) | 61 (67.8) | | |
| Systolic blood pressure (mmHg) | | | | 3.30 | 0.192 |
| <130 | 66 (32.4) | 97 (26.1) | 34 (24.6) | | |
| ≥131 | 138 (67.6) | 274 (73.9) | 104 (75.4) | | |
| Diastolic blood pressure (mmHg) | | | | 0.38 | 0.826 |
| <85 | 153 (75.4) | 281 (76.4) | 101 (73.7) | | |
| ≥86 | 50 (24.6) | 87 (23.6) | 36 (26.3) | | |
| Waist circumference (cm) [a] | | | | 2.98 | 0.236 |
| Normal | 84 (41.0) | 129 (34.7) | 46 (33.1) | | |
| Abnormal | 121 (59.0) | 242 (65.3) | 93 (66.9) | | |
| Adopting diet as therapy | | | | 1.77 | 0.461 |
| Often | 130 (63.4) | 228 (61.3) | 76 (56.3) | | |
| Not often | 75 (36.6) | 144 (38.7) | 59 (43.7) | | |
| Adopting exercise as therapy | | | | 12.18 | 0.003 |
| Often | 109 (53.2) | 150 (40.3) | 49 (36.3) | | |
| Not often | 96 (46.8) | 222 (59.7) | 86 (63.7) | | |

[a] Normal: male<90 cm, female <80 cm; Abnormal: male>90 cm, female >80 cm.

# Results

Odds of "feel good" versus "feel not bad" or "feel bad" obtained using ordinal logistic regression analysis

| Variables | OR | 95 % CI |
|---|---|---|
| Age (years)[a] | 9.62 | 0.80 –154.47 |
| Types of treatment | | |
| None | 1 | |
| OAD only[b] | 19.23 | 0.60 – 323.76 |
| Insulin only | 15.87 | 0.76 – 292.95 |
| Insulin and combined OAD | 8.85 | 0.31 – 102.51 |
| FG (mg/dl) | | |
| <130 | 3.87 | 7.46 – 27.66 |
| ≥131 | 1 | |
| HbA1C (%) | | |
| < 7.0 | 3.95 | 7.38 – 28.50 |
| ≥7.0 | 1 | |
| Triglyceride (mg/dl) | | |
| <150 | 12.82 | 0.20 – 90.02 |
| ≥151 | 1 | |
| Adopting exercise as therapy | | |
| Often | 19.23 | 2.83 –131.63 |
| Not often | 1 | |

Dependent variables: perceptions of diabetes control (1=feel good; 2=feel not bad (feel not bad/ok); and 3=feel bad)

[a] For continuous variables, parameter estimate gives the mean odds per unit increase of the predictor.

[b] OAD: oral antidiabetic drugs

# Conclusion & Discussion

○ A high percentage of participants overestimated their fasting blood glucose and $HbA_1C$ status.

○ Misperception and unawareness of diabetes control were prevalent among rural diabetic residents.

○ Addressing misperceptions by rural diabetic residents and increasing knowledge of professional advice in such individuals could be important steps in improving diabetes control in an elderly population.

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Thanks for your attention!

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