The Effect of Person-centred Diabetic Foot Care Education on Self-efficacy and Foot Care Behavior in People with Diabetes: A Randomized Control Trial

CHAN Ellen Yee Lun¹, SIT Janet Wing Hung ²

¹ Podiatry Department, Hong Kong East Cluster, Hospital Authority
² The Nethersole School of Nursing, The Chinese University of Hong Kong.
Content

- Background to the study
- Objectives
- Study method
- Results
- Discussion
- Conclusion and Recommendation
Prevalence of diabetic foot ulceration (DFU) in the world

No history of DFU 87%

≥1 episode of DFU 13%

(Al-Rubeaan et al., 2015; Danmusa et al., 2016; Dubsky et al., 2013; Mariam et al., 2017; Rice et al., 2014; Sarinnapakam et al., 2016; Sinharay et al., 2012; Zhang et al., 2016)
Recurrent DFU over the next 5 years

- Recurrent: 59%
- No recurrent: 41%

(Al-Rubeaan et al., 2015; Danmusa et al., 2016; Dubsky et al., 2013; Mariam et al., 2017; Rice et al., 2014; Sarinnapakam et al., 2016; Sinharay et al., 2012; Zhang et al., 2016)
• The risk of death for people with DFU is two folds higher than those who do not have an ulcerated foot in the diabetic population (Chammas et al., 2016).

• The five-year mortality rate is 40%-55% after the first occurrence of DFU (Jupiter et al., 2015; Robbins et al., 2008)
Impact of DFU

The occurrence of DFU is considered to distress the health related quality of life

- Negative impact in physical and psychosocial aspects in people with diabetes and their caregivers.

Enormous healthcare cost in managing DFU, diabetic related lower extremity amputation (LEA):

- ↑ medical and financial burden to our healthcare system

(Driver et al., 2010; Stockl et al., 2004)
International guidelines on DFU prevention

**NICE, 2015**

Diabetic foot problems: prevention and management

**NICE guideline**
Published: 26 August 2015
nice.org.uk/guidance/hg19

**American Diabetes Association, 2008**

Reviews/Commentaries/ADA Statements
Task Force Report

**Comprehensive Foot Examination and Risk Assessment**
A report of the Task Force of the Foot Care Interest Group of the American Diabetes Association, with endorsement by the American Association of Clinical Endocrinologists

**International Workgroup on the Diabetic Foot, 2015**

**IWGDF Guidance on the prevention of foot ulcers in at-risk patients with diabetes**
Prepared by the IWGDF Working Group on Prevention of Foot Ulcers

Authors

Institutions
1 Department of Rehabilitation Medicine, Academic Medical Center, University of Amsterdam, Amsterdam, the Netherlands.
2 Diabetic foot clinic, Department of Surgery, Ziekenhuisgroep Twente, Almelo and Hengelo, the Netherlands.

Key contacts
Reference

NICE National Institute for Health and Care Excellence
Diabetic foot problems: prevention and management

**NICE guideline**
Published: 26 August 2015
nace.org.uk/guidance/hg19
Clinical trigger

Low risk DM foot:
- Annual / biennial DM foot screening
- DM foot care education

At risk DM foot:
- Annual DM foot screening
- DM foot care education
- Preventive treatment

High risk DM foot:
- Specialized care for foot ulceration (advanced wound care technologies and products) / foot protection (orthotics etc)
- DM foot care education

Despite the availability of various national guidelines, clinical pathway and protocol of managing DM foot → Still high DFU or LEA rate 2005 vs 2010)

(Hicks et al., 2014)

Diabetic foot care (DFC) education is considered as one of cornerstone of DM foot protection...

(NICE, 2015)
Summary of existing knowledge – Effectiveness of diabetic foot care education

22 articles were included for integrated review

- 15 RCTs
- 6 systematic reviews
- 1 experimental study

Included studies (n=22)

Potential relevant citation from electronic databases (n=531)

- Excluded based on title, abstract (n=483)

Studies retrieved for in depth evaluation (n=48)

- Excluded due to inclusion and exclusion criteria (n=28)

Studies included in this review (n=22)

Added from hand searching of the reference list of systematic reviews articles (n=2)
Summary of existing knowledge – Effectiveness of diabetic foot care education

• Key components and delivery format of DFC education identified from current available evidence
  – Contents based on national guidelines, e.g., NICE, ADA, IWGDF
  • Delivery format: Individual counseling (n=10) session VS group educational class (n=5) (class size 6 to 30).
  • Professional involvement: depending on the availability of resources and expertise of staff e.g., nurse, podiatrist.
• Key outcome parameters for evaluating DFC education interventions:
  – improving diabetic foot care knowledge,
  – promoting self-care behavior,
  – enhancing self-efficacy,
  – reduction in DFU and LEA in people with diabetes

• However, effectiveness on DFC outcomes among reviewed studies varied and are inconsistent

Still lack of robust evidence to support the effectiveness of diabetic foot care education in various systematic reviews

(Dorresteijn et al., 2014; Singh et al., 2005; Valk et al., 2002)
A new person-centred DFC education guided by health-belief model was therefore designed with its effectiveness being evaluated.
Health belief model based DFC

1. Perceived susceptibility
2. Perceived threats
3. Perceived severity
良好的足部護理是日常生活中的重要一環，方法非常簡易，每天只要花幾分鐘時間便可完成。

**腳甲**
平日剪腳甲時，要沿著趾頭的形狀直剪，不要向腳甲兩旁的角剪下去，再用指甲錐磨滑兩旁的角位。

**雞眼/ 厚皮**
若發現腳上有雞眼或厚皮的情況，可用厚皮錐/浮水石挫薄，並向足病診療師求診；切勿用雞眼藥水/雞眼膠布或自行處理，以免做成損傷。

**每天應小心檢查雙腳**有否損傷，以便及早作出適當的處理。若視力欠佳可請他人協助。

**用溫水（大約 40℃）及中性肥皂**清潔雙腳，用手肘或溫度計測試水溫。

**清潔後應用柔軟的毛巾將雙腳及腳趾縫徹底抹乾。**

任何時間都不要赤腳走路，廚房、浴室等室內地方都應穿著拖鞋。

**足癬（即香港腳）**
足癬是皮膚的真菌感染，需及早找醫生或足病診療師治理，以免變成交纖。

**合適的鞋**
鞋內有軟墊，防腳跟刮損
鞋跟柔軟舒適，乾爽透氣
鞋繩或繩網設計，增加走路時的穩定性
鞋頭深且闊，容許腳趾有足夠空間，避免腳趾壓損
鞋底有坑紋，能吸震與防跣

買新鞋之後應每天只穿一段短時間，檢查雙腳有否因磨擦而紅腫，若雙腳給新鞋弄傷，表示鞋型並不適合，不宜再穿。

| 襪子不應太緊或彈力過強，以免影響血液循環；
| 夏天要穿純棉，冬天則穿羊毛棉保暖；
| 每天應更換襪子，破爛的襪子不宜修補，以免補口刮傷皮膚。|

4 Cues to action
Self-efficacy (Mutually agreed DFC plan by participants and podiatrist)
Individualized DFC education session lasts 8 to 15 minutes. Conducted by podiatrist.
Health-belief Model
(Rosenstock and Becker, 1988)

Individual Perception
- Perceived susceptibility / seriousness of disease
- Perceived threats of disease
  - Cues to action, e.g., education, symptoms, media information etc.
  - Self-efficacy

Modifying Factors
- Age, sex, ethnicity, personality, sociodemographic, knowledge

Likelihood action
- Perceived benefits vs barriers to behavioral change
- Likelihood of behavioral change
Objectives:

• To evaluate the effect of DFC education programme which is guided by health-belief model on self-efficacy and foot care behavior in people with diabetes.

Hypothesis (H₀):

• There is no significant difference on self-efficacy in diabetic foot care between experimental and control group.

• There is no significant difference on diabetic foot care behavior between experimental and control group.
Study methods

• Study design: multi-sites, 2-arm randomized control trial.

• Subjects recruitment:
  – New out-patient of Podiatry Department, Hong Kong East Cluster.

• Eligible participants were randomly assigned to one of the below groups:
  – Experimental Group (EG):
    • Receiving diabetic foot care education based on health-belief model
  – Control Group (CG):
    • Usual diabetic foot care education (Conventional didactic approach)
Study methods (continue)

• Randomization and allocation concealment:
  – Computer-generated random numbers in sealed opaque envelopes to assign control / intervention sequence in blocks of two by an independent personnel

• Researchers’ blinding
  – Outcome measurements were collected by trained data collectors who were blinded to group assignment
Sample size calculation

• Corbett (2003):
  – Effect size for evaluating the self-efficacy in diabetic foot care behavior and foot care behavioral change were 0.37 and 0.43 respectively.

→ Estimation: 115 participants per group
  – effect size of at least 0.37 on any outcome between the intervention and control groups at a post intervention time point with 80% power at 5% level of significance, assuming there is no between-group difference on the outcomes at the baseline after randomization.

• Attrition rate of 20% (Corbett, 2003)
  
  **144 participants per group**
Study design

Randomized (n=288)

Experimental Group

Assessment (A0):
Sociodemographic + Patient reported outcomes + Objective assessment

Health Belief Model Based DFC education:
- Diabetic foot ulceration risk
- Barriers in performing DFC task + solutions
- DFC techniques target individual needs
- Homecare plan mutually agreed by patients and podiatrist

Conventional DFC education:
- General DFC task

Week 0 (T0)

Week 4
- Telephone FU (Health belief model guided)

Week 8
- Telephone FU (Health belief model guided)

Week 12 (T1)
- Review & Assessment (A1)
  Subjective + Objective assessment

Telephone FU (General)

Telephone FU (General)
Sampling

**Inclusion criteria:**
- *Never* attend Podiatry Service before
- Age 18 or above
- **Type 2 diabetes** (on drugs / insulin / mixed)
- Able to read Chinese and speak Cantonese
- ADL independent (Modified BI $\geq 85$

**Exclusion criteria:**
- *Acute foot and ankle conditions* includes ingrown toenail, paronychia, cellulitis
- *Any lower extremities amputation*
- Old aged home residents
- Cognitive impairments (AMT $< 6$)
- Known psychiatric illness
- Both hands unable to reach feet
- Visual impairments that inhibit individuals to perform foot care independently
- Currently undergoing anti-cancer treatment
- On haemodialysis / peritoneal dialysis
Outcome measures (1)

• Sociodemographic data
• Clinical data including diabetes related data and co-morbidities.
• Subjective assessments (Patient reported outcomes)
  – Chinese Foot Care Confidence Scale (Chan & Sit, 2015)
  – Chinese Diabetic Foot Care Behavior Assessment (Chan & Sit, 2015)
Outcome measures (2)
Objective assessment: conducted by blinded assessor

- Hallux toenail cuticle to free edge index
- Hallux toenail relative thickness index
- Xerosis severity scale
- Tinea Pedis Clinical Score
Results

Accessed for eligibility (n=509)

Randomized (n=288)

Excluded (n=221)
• Not meeting inclusion criteria (n=201)
• Refuse to participate (n=20)

Week 0
(T0)

Experimental Group
(n=144)

Death (n=1)
Unable to contact (n=8)

Control Group (n=144)

Unable to contact (n=13)

Week 4

135 Successfully contacted

Week 8

125 Successfully contacted

Unable to contact (n=9)
Refuse for further contact (n=1)

Did not turn up for follow up (n=6)

120 completed Ax

Death (n=1)
Did not turn up for follow up (n=7)

119 completed Ax
(17.4% attrition)

112 completed Ax
(22.2% attrition)
Baseline Characteristics of patients: Sociodemographic data (1)

<table>
<thead>
<tr>
<th></th>
<th>Control Group (N=144)</th>
<th>Experimental Group (n=144)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>69.3 (11.3)</td>
<td>69.3 (10.5)</td>
<td>0.36&lt;sup&gt;T&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>74 (51.4%)</td>
<td>66 (45.8%)</td>
<td>0.35&lt;sup&gt;C&lt;/sup&gt;</td>
</tr>
<tr>
<td>Male</td>
<td>70 (48.6%)</td>
<td>78 (54.2%)</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary or below</td>
<td>59 (41.0%)</td>
<td>46 (31.9%)</td>
<td>0.28&lt;sup&gt;C&lt;/sup&gt;</td>
</tr>
<tr>
<td>Secondary</td>
<td>63 (43.8%)</td>
<td>73 (50.7%)</td>
<td></td>
</tr>
<tr>
<td>Tertiary or above</td>
<td>22 (15.3%)</td>
<td>25 (17.4%)</td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not working</td>
<td>104 (72.2%)</td>
<td>95 (66.0%)</td>
<td>0.51&lt;sup&gt;C&lt;/sup&gt;</td>
</tr>
<tr>
<td>Part time</td>
<td>9 (6.3%)</td>
<td>12 (8.3%)</td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>31 (21.5%)</td>
<td>37 (25.7%)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>T</sup>=<sup>T</sup>-test was used ; <sup>C</sup>: Chi square was used.
## Baseline characteristics of patients: Sociodemographic data (2)

<table>
<thead>
<tr>
<th></th>
<th>Control Group (N=144)</th>
<th>Experimental Group (n=144)</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cohabitation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives alone</td>
<td>16 (11.1%)</td>
<td>27 (18.8%)</td>
<td>0.13c</td>
</tr>
<tr>
<td>Lives with family</td>
<td>128 (88.9%)</td>
<td>117 (81.3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Mobility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walks unaided</td>
<td>119 (82.6%)</td>
<td>127 (88.2%)</td>
<td>0.17c</td>
</tr>
<tr>
<td>Walks with aids</td>
<td>25 (17.4%)</td>
<td>17 (11.8%)</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (4.2%)</td>
<td>9 (6.3%)</td>
<td>0.23c</td>
</tr>
<tr>
<td>Quitted</td>
<td>19 (13.2%)</td>
<td>28 (19.4%)</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>119 (82.6%)</td>
<td>107 (74.3%)</td>
<td></td>
</tr>
</tbody>
</table>

C: Chi square was used.
## Baseline characteristics of patients: Clinical data

<table>
<thead>
<tr>
<th></th>
<th>Control Group (n=144)</th>
<th>Experimental group (n=144)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of DM (years)</td>
<td>10.5 (8.8)</td>
<td>10.9 (8.0)</td>
<td>0.56\textsuperscript{T}</td>
</tr>
<tr>
<td>HbA1C (%)</td>
<td>7.2 (1.1)</td>
<td>7.2 (1.2)</td>
<td>0.43\textsuperscript{T}</td>
</tr>
<tr>
<td>Diabetes treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulin</td>
<td>2 (1.4%)</td>
<td>2 (1.4%)</td>
<td></td>
</tr>
<tr>
<td>OHA</td>
<td>111 (77.1%)</td>
<td>113 (78.5%)</td>
<td>0.94\textsuperscript{C}</td>
</tr>
<tr>
<td>Diet control</td>
<td>15 (10.4%)</td>
<td>12 (8.3%)</td>
<td></td>
</tr>
<tr>
<td>Insulin + OHA</td>
<td>16 (11.1%)</td>
<td>17 (11.8%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes Foot Risk (American Diabetes Association, 2008)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No LOPS, No PAD, No deformity</td>
<td>128 (88.9%)</td>
<td>126 (87.5%)</td>
<td>0.93\textsuperscript{C}</td>
</tr>
<tr>
<td>LOPS ± deformity</td>
<td>15 (10.4%)</td>
<td>17 (11.8%)</td>
<td></td>
</tr>
<tr>
<td>PAD ± LOPS</td>
<td>1 (0.7%)</td>
<td>1 (0.7%)</td>
<td></td>
</tr>
</tbody>
</table>

T: $T$-test was used; C: Chi square was used.
Baseline data of outcome measures

<table>
<thead>
<tr>
<th></th>
<th>Control Group (n=144)</th>
<th>Experimental Group (n=144)</th>
<th>( p^T )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subjective Assessment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot Care Confidence Scale</td>
<td>43.95 (8.34)</td>
<td>44.07 (8.17)</td>
<td>0.66</td>
</tr>
<tr>
<td>Diabetic Foot Care Behavior (Preventive)</td>
<td>0.60 (0.12)</td>
<td>0.60 (0.11)</td>
<td>0.50</td>
</tr>
<tr>
<td>Diabetic Foot Care Behavior (Damaging)</td>
<td>0.86 (0.09)</td>
<td>0.86 (0.10)</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Objective Assessment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallux toenail length (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>14.34 (2.31)</td>
<td>14.32 (3.32)</td>
<td>0.74</td>
</tr>
<tr>
<td>Left</td>
<td>14.35 (2.38)</td>
<td>14.34 (3.19)</td>
<td>0.46</td>
</tr>
<tr>
<td>Hallux toenail thickness (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>18.28 (1.73)</td>
<td>18.59 (2.19)</td>
<td>0.14</td>
</tr>
<tr>
<td>Left</td>
<td>18.22 (1.94)</td>
<td>18.51 (1.97)</td>
<td>0.52</td>
</tr>
<tr>
<td>Xerosis Severity Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>1.69 (1.58)</td>
<td>1.97 (1.45)</td>
<td>0.43</td>
</tr>
<tr>
<td>Left</td>
<td>1.68 (1.54)</td>
<td>1.97 (1.54)</td>
<td>0.87</td>
</tr>
<tr>
<td>Tinea Pedis Clinical Score</td>
<td>5.57 (4.67)</td>
<td>5.65 (4.69)</td>
<td>0.43</td>
</tr>
</tbody>
</table>

\( T: \) T-test was used.
Outcome measures at pre-test and post test between the control and experimental group (Subjective assessment)

<table>
<thead>
<tr>
<th></th>
<th>Control Group (mean)</th>
<th>Experimental Group (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot Care Confidence Scale (Possible range: 12 to 60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>43.95</td>
<td>44.07</td>
</tr>
<tr>
<td>Post-test</td>
<td>44.78</td>
<td>47.24</td>
</tr>
<tr>
<td>Change</td>
<td>0.84</td>
<td>3.17</td>
</tr>
<tr>
<td>Diabetic Foot Care Behavior Scale - Preventive (Possible range 0-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td>Post-test</td>
<td>0.53</td>
<td>0.48</td>
</tr>
<tr>
<td>Change</td>
<td>-0.07</td>
<td>-0.12</td>
</tr>
<tr>
<td>Diabetic Foot Care Behavior Scale – Damaging (Possible range 0-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>0.86</td>
<td>0.86</td>
</tr>
<tr>
<td>Post-test</td>
<td>0.86</td>
<td>0.88</td>
</tr>
<tr>
<td>Change</td>
<td>0.01</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Outcome measures at pre-test and post test between the control and experimental group
(Objective assessment)

<table>
<thead>
<tr>
<th></th>
<th>Control Group (mean)</th>
<th>Experimental Group (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Right</td>
<td>Left</td>
</tr>
<tr>
<td>Hallux toenail cuticle to free edge index (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>14.35</td>
<td>14.35</td>
</tr>
<tr>
<td>Post-test</td>
<td>13.67</td>
<td>13.93</td>
</tr>
<tr>
<td>Change</td>
<td>-0.68</td>
<td>-0.42</td>
</tr>
<tr>
<td>Hallux toenail relative thickness index (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>18.28</td>
<td>18.28</td>
</tr>
<tr>
<td>Post-test</td>
<td>18.13</td>
<td>18.07</td>
</tr>
<tr>
<td>Change</td>
<td>-0.15</td>
<td>-0.21</td>
</tr>
<tr>
<td>Xerosis Severity Scale (Possible range: 0 to 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>1.69</td>
<td>1.97</td>
</tr>
<tr>
<td>Post-test</td>
<td>1.18</td>
<td>1.28</td>
</tr>
<tr>
<td>Change</td>
<td>-0.51</td>
<td>-0.69</td>
</tr>
</tbody>
</table>
Outcome measures at pre-test and post test between the control and experimental group (Objective assessment) - Continue

<table>
<thead>
<tr>
<th>Tinea Pedis Clinical Score (Possible range: 0 to 20)</th>
<th>Control Group (mean)</th>
<th>Experimental Group (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>5.57</td>
<td>5.65</td>
</tr>
<tr>
<td>Post-test</td>
<td>5.25</td>
<td>5.04</td>
</tr>
<tr>
<td>Change</td>
<td>-0.32</td>
<td>-0.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of participants reported foot wound developed during the study period:</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tinea pedis related</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Eczema</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cut during toenail care</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>5</td>
<td>0.92</td>
</tr>
</tbody>
</table>

C: Chi square was used.
Generalized estimating equation (GEE) models for the comparison of the outcome across time between experimental and control group

<table>
<thead>
<tr>
<th></th>
<th>B(95%CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subjective Assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot Care Confidence Scale</td>
<td>3.75 (1.52, 5.98)</td>
<td>0.001*</td>
</tr>
<tr>
<td>Diabetic Foot Care Behavior (Preventive)</td>
<td>-0.05 (-0.07, -0.02)</td>
<td>0.001*</td>
</tr>
<tr>
<td>Diabetic Foot Care Behavior (Damaging)</td>
<td>0.30 (0.01, 0.06)</td>
<td>0.018*</td>
</tr>
<tr>
<td><strong>Objective Assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallux toenail cuticle to free edge index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>-0.75 (-1.40, -0.10)</td>
<td>0.024*</td>
</tr>
<tr>
<td>Left</td>
<td>-0.65 (-1.29, -0.01)</td>
<td>0.045*</td>
</tr>
<tr>
<td>Hallux toenail relative thickness index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>-0.44 (-0.88, 0.01)</td>
<td>0.057</td>
</tr>
<tr>
<td>Left</td>
<td>-0.31 (-0.71, 0.10)</td>
<td>0.143</td>
</tr>
<tr>
<td>Xerosis Severity Score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>-0.18 (-0.55, 0.19)</td>
<td>0.347</td>
</tr>
<tr>
<td>Left</td>
<td>-0.23 (-0.61, 0.15)</td>
<td>0.244</td>
</tr>
<tr>
<td>Tinea Pedis Clinical Score</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.30 (-1.39, 0.80)</td>
<td>0.597</td>
</tr>
</tbody>
</table>

*P<0.05 denotes statistically significant result
Diabetic foot care education using Health-belief model has:

**Statistically significant effect:**
- ↑ Self efficacy in DFC
- ↑ Preventive DFC behavior
- ↓ Damaging DFC behavior
- ↓ Toenail cuticle to free edge index

**No statistically significant effect:**
- Relative toenail thickness index
- Skin dryness on feet
- Tinea Pedis
- Foot wounds / ulcerations development
• Consistent with previous studies:
  †Self efficacy in DFC (Corbet, 2003)
  †DFC behavior (Borges & Ostwald, 2008; Lincoln et al., 2008)

• Inconsistent with previous studies:
  – Foot appearance (Bloomgarden et al., 1987)
• Possible reasons for no significant difference in objective assessment:
  – No gold standard in measuring toenail thickness
  – Management of dry skin:
    • Relative humidity varies across the year
    • Take time
  – Management of tinea pedis
    • ? Efficacy of topical antifungal available
    • Usually takes >12 weeks for improvement shown.
Clinical significance

• Health-belief model and diabetic foot care education:
  – Easy and quick to adopt in busy clinical setting
  – Emphasize on person centered
  – Identify the individual perception and modifiable factors → intervene accordingly
  – Not much extra resources are required

• The results of this study could shed light to existing diabetic foot protection, not only limited to diabetic nurses and podiatrists, but also other professions in the trans-disciplinary team could benefit from this.
Conclusion

• The person-centred diabetic foot care education using health belief model was found beneficial to people with diabetes in terms of DFC efficacy and behavior.

• Clinician should review their current DFC education program and consider to adopt person-centred approach to advocate the importance of DFC and DFU prevention.
Way forward

• Worth to evaluate the lasting effect of this person-centred based DFC education.
• Implement in high risk group of diabetic foot ulceration
• Train Patient Care Assistants to deliver the education content.
Acknowledgement

• Mr Hercy LI, ex-CSC(AH), HKEC
• Mr Michael CHUNG, CSC(AH), HKEC
• Ms Bonnie CHOW, HKEC PODI
• Mr Gary SEE, HKEC PODII
• Ms Patricia LEE, HKEC PODII
• Mr Benjamin SO, HKEC PODII
• All PCAs and clerical supporting staff of HKEC Podiatry Departments
• Dr K.C CHOI, Senior Research Fellow, CUHK
Reference


• National Health Service (2015). NICE guideline on Diabetic foot problems: Prevention and management. UK


