PREDICTORS OF SUCCESSFUL DIABETES MANAGEMENT IN PEOPLE WITH TYPE 2 DIABETES IN TLAXCALA, MEXICO

Chris Latham D.N.Sc., RN

US AID-TIES Grant Partnership:
California State University, Fullerton
Universidad Autónoma de Tlaxcala
The specific aim of this predictive, correlational study was to test a culturally sensitive diabetes-specific health protection model to determine predictors of successful Type 2 diabetes management in an adult population in Tlaxcala, Mexico.
Hispanic Health Protection Theoretical Framework

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Sociocultural/ Physiologic Factors (t₁)</th>
<th>Enabling Factors (t₂)</th>
<th>Outcomes (t₃)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Influences</td>
<td>Health-Related Influences</td>
<td>Behavior – Specific Influences</td>
<td>Self – Care Outcomes (Adherence to Diabetes Regimen)</td>
</tr>
</tbody>
</table>

Conceptual Framework

- Personal Characteristics
- Physiological Characteristics
- Perception of Current Health Status
- Perceived Barriers To Behavior
- Interpersonal Support - Professional
- Interpersonal Support - Social
- Self - Efficacy
- Behavioral Indices of Diabetes Self - Regulation
- Lifestyle Behaviors
- Cognitive
- Psychologic
- Physiologic
USA Replication in Mexico: Hypotheses

H1: Pre-morbid lifestyle and health beliefs will directly affect the newly diagnosed diabetic’s perceptions of self-efficacy, and social & professional support.
H2: Pre-morbid lifestyle will have a direct positive effect on the newly diagnosed diabetic’s cognitive understanding of diabetes and quality of life.
H3: Physiologic indicators of health status (HbA1c & BMI) will positively influence clients’ perceptions of self-efficacy and final physiological outcomes
H4: Professional support will have a positive effect on diabetes self-efficacy.
H5: Social support will positively influence quality of life.
H6: Self-efficacy will positively influence cognitive understanding of diabetes, quality of life, and physiologic outcomes.
H7: Cognitive understanding of diabetes (knowledge about diabetes and required lifestyle changes) will positively influence physiological outcomes.
Methodology

- Convenience sample of 109 participants from the Tlaxcala community with confirmed diagnoses of Type 2 diabetes
- Exclusion criteria included chronic infection(s), diagnosed psychiatric disease or personality disorders, and known substance abuse.
- Clinic intake, then two home-based questionnaires were conducted over two points in time over 4-6 months
<table>
<thead>
<tr>
<th>Name of Questionnaire</th>
<th>Validity and Reliability</th>
<th>Score Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifestyle Profile</td>
<td>• Content validity; used with Spanish-speaking immigrants</td>
<td>Score = 2.54</td>
</tr>
<tr>
<td></td>
<td>• Cronbach’s alpha = .92</td>
<td>Sometimes to often used positive lifestyle behaviors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Higher than U.S.</td>
</tr>
<tr>
<td>Health Belief Instrument</td>
<td>• Validity obtained through factor analysis and group contrast</td>
<td>Score = 1.67</td>
</tr>
<tr>
<td></td>
<td>• Cronbach’s alpha = .77</td>
<td>Higher belief in folk healing and control over health</td>
</tr>
<tr>
<td>Patient Satisfaction Instrument</td>
<td>• Convergent and discriminant validity established in 2 studies</td>
<td>Score = 3.23</td>
</tr>
<tr>
<td></td>
<td>• Total score Cronbach’s alpha of .86</td>
<td>Lower score than U.S.</td>
</tr>
<tr>
<td>Perceived Social Support (from Family (Fa) and Friends (Fr))</td>
<td>• Discriminant and convergent validity in 3 studies with other psychological and social trait scales</td>
<td>Score = 13.06</td>
</tr>
<tr>
<td></td>
<td>• Cronbach alphas: Fa = .90; Fr = .81</td>
<td>Lower score than U.S.</td>
</tr>
<tr>
<td>Name of Questionnaire</td>
<td>Validity and Reliability</td>
<td>Score Comparisons</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Diabetes Self-Efficacy Scale</td>
<td>• Content validity, using factor analysis, confirmed the four factors</td>
<td>Score = 2.74 Higher self-efficacy than U.S. with ability to handle DM</td>
</tr>
<tr>
<td></td>
<td>• Total score Cronbach alpha = .88</td>
<td></td>
</tr>
<tr>
<td>Diabetes Knowledge Test</td>
<td>• Content validity was established by experts in endocrinology and diabetes nursing</td>
<td>Score = 30.55 Lower than U.S. score, extremely low understanding</td>
</tr>
<tr>
<td></td>
<td>• Total score Cronbach alpha of .83</td>
<td></td>
</tr>
<tr>
<td>Diabetes Quality of Life Measure: <em>Disease impact on self-satisfaction</em> and <em>Impact of Diabetes on quality of life</em></td>
<td>• Content validity by expert review by health professionals with clinical experience with diabetes, &amp; a field test with 192 patients with Type 1 diabetes</td>
<td>Self-Satisfaction Score = 2.42</td>
</tr>
<tr>
<td></td>
<td>• Cronbach alphas = self-satisfaction with DM = .89 &amp; impact of DM = .78</td>
<td>Impact of DM Score = 2.68 Lower QOL than U.S.</td>
</tr>
</tbody>
</table>
Physiologic Parameters

- Hemoglobin A1c – Glycosylated hemoglobin is a direct biochemical marker of diabetes metabolic control over the previous 8-12 weeks and is superior to casual blood glucose determinations.
- Body Mass Index – Calculated from height and weight.
Human Subject Precautions

- UAT review and approval of procedures
- Informed consents obtained from participants
- Attrition – 109 of 112 participants completed all interviews
Findings: Description of Sample

- Gender: 80% female
- Age: \( x = 47.5 \) years, range 27-103 (only 1 person older than 83 years of age); bell-shaped curve
- Education: 50% had up to 6 years of formal education; 21.4% had up to 9 years
- Health Care Insurance: 23 of the 109 did not report; 79% (\( n = 86 \)) had medical insurance
Findings: Description of Sample

- Residence: 56% of participants lived in Tlaxcala; others in surrounding areas.

- Marital Status: 62.4% were married (n = 68).

- Household: Most homes had 4-5 residents; ranged was from 1-11/household. Approx. 50% of daughters and 61% of sons live with family; 24-37% include grandparents.
Findings: Description of Sample

- **Employment:** 32% work full-time; 22% work part-time; 6% unemployed; 26.2% either retired or disabled. 13.8% (n=15) were enrolled as students.

- **Co-morbidities:** 39.4% had diabetes mellitus-related co-morbidities, including cardiovascular, (heart or hypertension) and renal. Almost 3% reported a diagnosis of cancer.
Findings: Description of Sample

- Health care: 24.8% used a herbalist folk healer, and/or masseuse; 59% used medical doctors, 27% used dentists, and 12% used a nutritionist.
- Preventive health care: 23% sought disease prevention assistance from someone.
- 24% had difficulty following recommendations to either take medications (8.2%), follow diet (2.1%), exercise (11.6%), quitting smoking or drinking (1%).
Findings: Description of Sample

- Self-Care: 37% used herbal teas and 12% ate certain foods to treat own health problems.

- Rating of health: 73 indicated a “fair-good: rating of their health as compared to others.”
Summary of Tlaxcala Participants

- Believed that they had good lifestyle habits
- Continued to adhere to culturally-based treatment & attribution beliefs
- Held moderate perceptions of diabetes self-care efficacy & low ratings of support
- Had a very poor understanding of diabetes
- Continued to be overweight, acceptable quality of life ratings and near-normal HbA1c levels at 6 months post diagnosis.
Statistical Analyses

- Log transformation of two subscales of the Diabetes QOL Tool (Self Satisfaction and Impact)
- Correlation < .60-.70 confirmed the absence of multicollinearity between the final model variables, Durbin-Watson (2.44) and VIF stats (1.045-1.209)
- Path analyses and structural models using AMOS 16.0 with most likelihood estimation
- Goodness of Fit and the Comparative Fit Index = 0.95-1.00
- Parsimonious, best-fitting models were completed by deletion of non-significant paths (p<.05) and without significantly increasing Chi Square
Figure 2. Five Partial Models

Lifestyle Profile

R² = .06, .07, .07, .10, .10
Perceived Social Support
Family & Friends

Patient Satisfaction
with Professional Support

R² = .05, .10, .10, .09, .09

Health Beliefs

Diabetes Self Efficacy

R² = .01, .01, .03, .03

Initial BMI

R² = .37, .15
Quality of Life

Health Beliefs

Diabetes Self Efficacy

R² = .01, .01, .03, .03

Initial HbA1c

R² = .48, .48
HbA1c Difference

Model 1: Predictors of diabetes knowledge and quality of life outcomes.

Model 2: Predictors of perceptions of support, quality of life and physiological outcomes.

Model 3: Predictors of patient support, satisfaction and physiological outcomes.

Model 4: Predictors of support, satisfaction, quality of life, diabetes knowledge and physiological outcomes.

Model 5: Predictors of support, satisfaction, quality of life and physiological outcomes.
Summary of Hypotheses

• 1\textsuperscript{st} H as partially supported: Lifestyle helped to explain Social Support and Health Beliefs explained Professional Support

• 2\textsuperscript{nd} H was partially supported: Lifestyle explained Quality of Life Outcomes (37%)

• 3\textsuperscript{rd} H was supported: Physiological indicators did explain final HgA1c (48%) & BMI (with self-efficacy 19%)

• 6\textsuperscript{th} H was supported: Self-efficacy explained QOL and Weight Loss, while QOL helped to explain Knowledge of Diabetes Score
Summary of Hypotheses

- 4th and 5th Hs were not supported: There were lower provider and social support ratings with better outcome scores than USA sample.

- 7th H was not supported: Extremely low knowledge scores did not help to explain the slight weight loss (BMI 26.67 to 26.36) and HgA1c change (from 7.74 to 7.33).
Discussion of Findings

• HHPM upheld with many similar findings to USA sample
• Lifestyle Profiles and Self-efficacy are an important factors in successful diabetes QOL outcomes, and Self-efficacy is important to weight loss
• Patient satisfaction with healthcare and social support didn’t explain outcomes
• Health beliefs, based in culture, are important influencing factors with ratings of patients’ satisfaction with healthcare
Verification of Findings with other DM Research in Mexico

- Difficulty changing lifestyle habits
- Continue to hold traditional beliefs
- Place family needs over individual needs
- Need professional support in carrying out regimen (moderate level of trust by group)
- HC Providers must know lifestyles and self-efficacy of patient – these variables favorably affected QOL
- Family members do not know how to support someone with a new dx of DM
Thank you! - CSUF and UAT

Data Collectors: 2007-2008

Data Collectors: 2008