科技部補助專題研究計畫成果報告
期末報告

糖尿病婦女角色緊張與疾病控制：量表發展至徑路模式建構(L03)

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報 告 附 件 ： 出席國際學術會議心得報告

本研究具有政策應用參考價值：■否 □是，建議提供機關
（勾選「是」者，請列舉建議可提供施政參考之業務主管機關）
本研究具影響公共利益之重大發現：□否 □是

中 華 民 國 108 年 11 月 26 日

中 文 摘 要 ： 研究背景：當糖尿病婦女試著平衡社會期待之角色與自我管理角色時可能會經歷角色緊張。
發展短版量表測量糖尿病婦女的角色緊張，可幫助健康照護提供者評估婦女的角色緊張與糖尿病控制的相關。
目的：發展短版台灣版糖尿病婦女角色緊張量表，並測量其心理特性。
方法：採橫斷性研究設計，依據文獻回顧與焦點團體的結果，發展28題的台灣糖尿病婦女角色緊張量表，並以519位台灣糖尿病婦女進行測試及。以內容效度、項目分析、探索性因素分析、驗證性因素分析、同時效度、內部一致性及再測信度來檢驗量表的心理特性。此研究收集資料期間為2018年十月至2019年五月。
結果：探索性分析及驗證性因素分析支持此9題的台灣糖尿病婦女角色緊張量表，包括角色罪惡、角色衝突之分量表。此9題量表與憂鬱($r = 0.399$, $p < .001$)及糖化血色素($r = 0.169$, $p < .001$)呈顯著相關，全量表與分量表Cronbach's α為0.78至0.86之間，再測信度為0.64至0.81之間。
討論：此短版台灣糖尿病婦女角色緊張量表具有良好信度及效度，並可用來評估糖尿病婦女的角色緊張。

中 文 關 鍵 詞 ： 糖尿病、角色緊張、糖尿病婦女

英 文 摘 要 ： Background: Women with diabetes might experience role strain when they intend to balance the roles of social expectation and self-management. A short-form scale to measure the role strain of women with diabetes would help healthcare providers assess the role strain and their relationship with diabetes control.
Objective: The aim of the study was to develop a short-form scale for role strain in Taiwanese women with diabetes and test the psychometric properties.
Methods: This study employed a cross-sectional design. Based on literature reviews and results of focus groups, a 28-item role strain scale for Taiwanese women with diabetes was developed and administered to 519 women with diabetes in Taiwan. The content validity, item analysis, exploratory factor analysis, confirmatory factor analysis, concurrent validity, internal consistency, and test-retest reliability were used to examine the psychometric characteristics of the scale. This study was conducted from October 2018 to May 2019.
Results: A 9-item role strain scale for Taiwanese women with diabetes, including subscales for role guilt and role conflict, supported by exploratory factor analysis and confirmatory factor analysis, was produced. Scores of the scale signicantly correlated with depression ($r = 0.399$, $p < .001$) and hemoglobin A1C levels ($r = 0.169$, $p < .001$). The overall and subscale Cronbach's α ranged between 0.78 and 0.86. The overall and subscale test-retest reliability

ranged between 0.64 and 0.81.
Conclusions: The role scale for Taiwanese women with diabetes is reliable and valid and can be used to evaluate role strain in women with diabetes.

英文關鍵詞：diabetes mellitus, role strain, women with diabetes

附件一

科技部補助專題研究計畫成果報告

（□期中進度報告/■期末報告）

糖尿病婦女角色緊張與疾病控制：量表發展至徑路模式建構(L03)

計畫類別：■個別型計畫　□整合型計畫
計畫編號：MOST 107－2629－B－037－001
執行期間：2018 年 08 月 01 日至 2019 年 10 月 31 日

執行機構及系所：高雄醫學大學　護理學系

計畫主持人：王瑞霞
共同主持人：李洮俊
計畫參與人員：徐慧君（協同研究人員）、林祺（專任助理）

本計畫除繳交成果報告外，另含下列出國報告，共 _1_ 份：
□執行國際合作與移地研究心得報告
■出席國際學術會議心得報告
□出國參訪及考察心得報告

中　華　民　國　108 年　11 月　26 日

目錄

摘要

研究背景：當糖尿病婦女試著平衡社會期待之角色與自我管理角色時可能會經歷角色緊張。發展短版量表測量糖尿病婦女的角色緊張，可幫助健康照護提供者評估婦女的角色緊張與糖尿病控制的相關。

目的：發展短版台灣版糖尿病婦女角色緊張量表，並測量其心理特性。

方法：採橫斷性研究設計，依據文獻回顧與焦點團體的結果，發展 28 題的台灣糖尿病婦女角色緊張量表，並以 519 位台灣糖尿病婦女進行測試及。以內容效度、項目分析、探索性因素分析、驗證性因素分析、同時效度、內部一致性及再測信度來檢驗量表的心理特性。此研究收集資料期間為 2018 年十月至 2019 年五月。

結果：探索性分析及驗證性因素分析支持此 9 題的台灣糖尿病婦女角色緊張量表，包括角色罪惡、角色衝突之分量表。此 9 題量表與憂鬱($r = 0.399$, $p < .001$)及糖化血色素($r = 0.169$, $p < .001$)呈顯著相關，全量表與分量表 Cronbach's α 為 0.78 至 0.86 之間，再測信度為 0.64 至 0.81 之間。

討論：此短版台灣糖尿病婦女角色緊張量表具有良好信度及效度，並可用來評估糖尿病婦女的角色緊張。

關鍵字：糖尿病、角色緊張、糖尿病婦女

Abstract

Background: Women with diabetes might experience role strain when they intend to balance the roles of social expectation and self-management. A short-form scale to measure the role strain of women with diabetes would help healthcare providers assess the role strain and their relationship with diabetes control.

Objective: The aim of the study was to develop a short-form scale for role strain in Taiwanese women with diabetes and test the psychometric properties.

Methods: This study employed a cross-sectional design. Based on literature reviews and results of focus groups, a 28-item role strain scale for Taiwanese women with diabetes was developed and administered to 519 women with diabetes in Taiwan. The content validity, item analysis, exploratory factor analysis, confirmatory factor analysis, concurrent validity, internal consistency, and test-retest reliability were used to examine the psychometric characteristics of the scale. This study was conducted from October 2018 to May 2019.

Results: A 9-item role strain scale for Taiwanese women with diabetes, including subscales for role guilt and role conflict, supported by exploratory factor analysis and confirmatory factor analysis, was produced. Scores of the scale significantly correlated with depression ($r = 0.399$, $p < .001$) and hemoglobin A1C levels ($r = 0.169$, $p < .001$). The overall and subscale Cronbach's α ranged between 0.78 and 0.86. The overall and subscale test-retest reliability ranged between 0.64 and 0.81.

Conclusions: The role scale for Taiwanese women with diabetes is reliable and valid and can be used to evaluate role strain in women with diabetes.

Key Words: diabetes mellitus, role strain, women with diabetes

Introduction

Diabetes is an international health problem associated with complications and mortality.[1] The global diabetes prevalence was 8.8% of the world population in 2017.[1] In Taiwan, the prevalence of diabetes was 9.65% in men and 8.99% in women in 2014.[2] Although the prevalence of diabetes in women was lower than in men, the women experienced more depression, coronary heart disease, and sexual problems than men with diabetes.[3,4] Diabetes control has special challenges for women.

Traditionally, young and middle-aged women have been obligated to perform certain socially expected roles such as wife, daughter, daughter in law, or even employee. Besides the traditionally expected roles, women with diabetes have the additional role of performing diabetes self-management activities such as exercising, maintaining a healthy diet, taking medication, and regularly visiting their physicians. The roles of women with diabetes are more complicated than those of healthy women and men with diabetes.

Individuals who possess multiple roles are required to perform these roles to maintain their social relationships in society. Each role has certain demands, which means the individual must be responsible for additional tasks.[5] Multiple role performances can lead to role strain in women.[5]

The concept of role strain was first developed by Goode.[5] Simultaneously performing multiple roles but not successfully balancing the different roles' responsibilities can result in role strain. Role strain is a subjective experience in which the person feels difficulty in meeting the obligations of the different roles.[5] Role strain for women is traditionally considered a negative experience that includes tension, anxiety, or frustration because of the demands of having multiple roles.[5] Reid and Hardy[6] supported the proposition of Goode[5] and described role strain of women as including role overload (demands exceed capacities), inter-role conflict (demands of multiple roles are incompatible), role captivity (an individual takes on a role unwillingly), and role constructing (adult children assume increasing responsibility for their parents).

In contrast, Sieber[7] proposed that the individual might obtain rewards or privileges from multiple role performances, which is referred to as role accumulation. Sieber[7] identified four positive aspects of role strain, including role privileges, overall status security, resources for status enhancement and role performance, and enrichment of the personality, and ego gratification. Lengacher[8] defined role strain as a subjective experience, including positive and negative forces that include aspects of role distress, role enhancement, and role support. In summary, role strain could include only negative attributes or both positive and negative attributes, depending on the culture and study population.

Women with diabetes might also experience role strain when they intend to balance the roles of social expectation and self-management. Nevertheless, only limited data is available, and most data are qualitative and explored the experience of role strain in women with diabetes. A qualitative study of Korean women with diabetes revealed that these women sacrificed themselves in favor of others and perceived themselves in charge of their diabetes.[9] Role strain derived from diabetes control intertwined with past and current daily life roles in women with diabetes.[9] A study in India indicated that women with diabetes experience conflict between their family roles and their self-care activities, for example, conflict in preparing their diabetes-healthy food and the usual meals of their families.[10]Another qualitative study in Taiwan indicated that women with diabetes perceived themselves to become care receivers rather than care providers. Furthermore, family members blamed them if they had poor glycemic control. Nevertheless, women with

diabetes might also dedicate themselves to diabetes control to fulfill their caregiver roles.[11] From these previous studies, experiences of role strain in women with diabetes could include both positive and negative aspects.

Few instruments have been specifically developed to measure the role strain of women with diabetes. However, some scales were developed to measure role strain in working women. Lengacher[12] developed the 44-item Women's Role Strain Inventory based on Goode's Theory of Role Strain[5]and Siebel's Theory of Role Accumulation.[6] The Women's Role Strain Inventory measured role strain of women from perspectives of role distress, role enhancement, and role support. Kolagari et al.[13] developed a 33-item role strain scale to measure the role strain of nursing teachers. This scale included subscales of role conflict, role ambiguity, role overload, role incompetence, and role incongruity. Yang et al.[14] adapted the Women's Role Strain Inventory and developed a 24-item Chinese version of the Women's Role Strain Inventory to understand the role strain of Chinese working women. This scale also includes subscales of role distress, role enhancement, and role strain. These scales proved to be reliable and valid to measure role strain of women. However, the scales were not specific for women with diabetes, especially in Asian countries. Furthermore, the scales included many items that might limit their utility for clinical use.

A short-form scale to measure the role strain of women with diabetes would help healthcare providers assess the role strain and the relationship with diabetes control in women with diabetes. Therefore, we aimed to develop a short-form scale to measure role strain in women with diabetes (RSWD) and test the psychometric properties in Taiwanese women with diabetes.

Methods

Design and sample

A cross-sectional design was used in this study. Participants were selected from a medical center, a regional hospital, and a regional clinic in Taiwan. The inclusion criteria of the participants were women age 20 to 64 years with a diagnosis of type 1 or 2 diabetes, a duration after diagnosis of at least six months, and the ability to communicate in Mandarin Chinese. For normal multivariate data distribution, the sample size should exceed 10 participants per item.[15] We estimate that 25 items might be included in the RSWD scale; therefore, just over 250 samples would be required. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to assess the construct validity of the RSWD scale. The CFA sample size was also determined using a power analysis based on the root mean square error of approximation (RMSEA).[16] Given an α level of .05 and power of 0.8, the RMSEA was set at 0.05 and 0.08 for the null and alternative models, respectively. The minimum sample size was 100.

In summary, the required sample size was estimated to be 250 samples. Considering that EFA and CFA were conducted on different samples to cross-validate the construct validity of RSWD, the required sample size was doubled to be 500 samples. Thus, 519 participants were recruited and were randomly assigned to group 1 or group 2 by computer. The data of group 1 (n = 259) were used to conduct the item analysis and EFA, whereas the data of group 2 (n = 260) were used to conduct the CFA. Concurrent validity and internal insistency were tested with all participants. Data were collected from October 2018 to May 2019.

Procedures

1. Item generation and content validity testing

The RSWD scale was first developed based on the Women's Role Strain scales,[12] the Chinese version the Women's Role Strain Inventory,[14] and previous qualitative studies in women with diabetes.[9-, 10, 11] Originally, the RSWD included 36 items that belonged to certain subscales of role distress (22 items), role enhancement (5 items), and role support (9 items). Role distress refers to the experience of frustration because of performing multiple roles, such as self-management, caregiver, and employee. Role enhancement refers to the positive rewards gained by performing multiple roles, such as the increasing ability to set a schedule. Role support refers to obtaining support from family and co-workers in performing multiple roles. Each item was rated on a scale from "strongly disagree" (1) to "strongly agree" (5), according to the level of agreement with a series of statements. Items of role enhancement and role support were reversely scored such that a higher score indicated higher role strain.

Two focus groups of 16 women with diabetes each and aged from 20 to 64 years were conducted to examine the relevance and comprehensiveness of the 36-item RSWD scale. The women were invited to answer the 36-item RSWD and provide suggestions regarding comprehensiveness and item wordings. According to the suggestions, 10 items were deleted because measurements overlapped with other items. Two items were added to improve the comprehensiveness of the RSWD scale. Finally, the first draft of the 28-item scale included 20 items of role distress, six items of role support, and two items of role enhancement was developed and subjected to content validity analysis by experts. One professor, one endocrine physician, and two diabetes educators were invited to examine the relevance of each item by scoring from 1 (very irrelevant)

to 4 (very relevant).[17]The item-level content validity index (CVI) ranged from 0.86 to 1.0. The scale-level CVI was 0.95. The content validity of the 28-item RSWD scale was acceptable.[17]

2. Item analysis

The item-total correlation was used to delete redundant items. Items with item-total correlation smaller than 0.3 or larger than 0.7 were deleted because of insufficient correlation to measure the concept or because of redundancy.[18] Items with an absolute value of skewness or kurtosis larger than two were also deleted due to a lack of symmetry or normal distribution.[19]

3. Construct validity

First, EFA was used to examine the construct validity of retained items after the item analysis. A principal component method with oblique rotation was used to conduct the EFA because the assumed subfactors of the RSWD scale were interrelated. Considering good items should capture at least 40% of the variance of a concept,[20] items with factor loading smaller than 0.63 were omitted.

To cross-validate the factor structure produced by EFA, the data from group 2 were used to examine the construct validity of the RSWD by CFA based on the factor structure produced by EFA. The data fit was considered acceptable if the fit indices of χ^2-df ratio were less than 3, the goodness of fit index, comparative fix index, and non-normed fit index were greater than 0.90, and the RMSEA was less than 0.08.[21,22]

4. Concurrent validity

Two criteria were used to assess the concurrent validity of the RSWD scale. General role strain was found to be significantly associated with depression in Korean women with type 2 diabetes.[23] Depression was a criterion to assess the concurrent validity of the RSWD scale. The Chinese version of the Epidemiologic Studies Depression Scale (CES-D)[24] was used to assess the frequency of depressive symptoms of participants in the week before the study started. Each item of the CES-D was rated from 0 (less than one day per week) to 3 (more than five days per week). Negative items were reversely scored. High scores indicated high levels of depression. Only the participants of two sampling hospitals (n = 317) completed the CES-D because of the administrative considerations. Because the RSWD scale was expected to assess the problems of diabetes control in women, HbA1c (hemoglobin A1c) level was the second criteria to assess the concurrent validity of the RSWD scale. The first HbA1c level measured after the completion the RSWD scale was collected from medical records. Correlations of the RSWD scale score with depression and HbA1c levels were calculated.

5. Reliability testing

The final version of the RSWD scale was further tested for internal consistency and test-retest reliability. The data from the 519 participants were included in the internal consistency test of the RSWD scale. The evaluation of test-retest reliability of the final version RSWD scale was administered to 20 participates twice with a 2-week interval, and the test-retest reliability was calculated using intraclass correlation coefficients.

Ethical considerations

This study was approved by the institutional review boards of the three participating hospitals (KMUHIRB-E(I)-20180108, YUAN-IRB-20180921B, TSGHIRB-2-107-05-151). Participants were informed that they could refuse or withdraw from the study at any time. Each participant voluntarily signed a consent form before participating in this study.

Statistical Methods

The item analysis, Cronbach's α, descriptive statistics, bivariate correlation, and the EFA were performed using SPSS version 17.0 for Windows. The CFA was performed using a structural equation modeling program (IBM SPSS Amos version 22.0). All statistical analyses were two-sided, and a p-value $< .05$ was considered significant.

Results

Personal characteristics

Table 1 shows the distributions of personal characteristics and the comparisons between groups 1 and 2. The mean (SD) age in both groups was about 52 (9) years. Most participants were diagnosed with type 2 diabetes. There were no significant differences in the distributions of the personal characteristics between groups 1 and 2.

Item analysis

After the item analysis of the first draft of the 28-item RSWD scale, five items were discarded because the item-total correlations were smaller than 0.3. Furthermore, eight items were discarded because the absolute values of skewness or kurtosis were greater than 2.0. Overall, all items (two items) of the subscale of role enhancement and role support (6 items), as well as five items of the subscale of role distress, were discarded. Finally, 15 items were subjected to EFA to examine the construct validity.

Construct validity

EFA was conducted on group 1 to examine the construct validity of the 15-item RSWD scale. After EFA, the value of the Kaiser-Meyer-Olkin measure of sampling adequacy was .87, Bartlett's test of sphericity: x^2 = 873.66, df = 36, $p < .01$. This measure indicated the samples were appropriate for EFA. Six items were deleted because the factor loadings were less than 0.63. Finally, two factors named "role guilty" (four items) and "role conflict" (five items) were extracted and explained 47.15% and 12.17% of the total variance of role strain, respectively. Role guilty refers to feeling embarrassed because of failure to fulfill the expected roles. Role conflict refers to feeling discomfort because of the discrepancy in performance between the expected and actual roles. The contents of the 9-item RSWD scale, mean distributions, and the factor loadings of each item are shown in (Table 2).

The construct validity of 9-item RSWD scales was further examined using CFA based on the factor structure produced in the EFA, which was conducted in group 2. A two-correlated first-order factor CFA was used to examine the data fit. All nine items were significantly loaded on their corresponding factors produced in the EFA (Figure 1). The fit indices were acceptable, including χ^2 = 58.78, df = 25, $p < .001$, χ^2-df ratio = 2.35, goodness of fit index = 0.95, non-normed fit index = 0.95, comparative fix index = 0.97, and RMSEA = 0.72. The standardized factor loading of each item ranged from 0.57 to 0.85. Factors of role guilty and role conflict were significantly correlated (r = 0.63).

Concurrent validity and reliability

The scores of the RSWD scale are significantly correlated with the CES-D (r = 0.399, $p < .001$). Furthermore, the scores are significantly correlated with HbA1C levels (r = 0.169, $p < .001$). The Cronbach's α of the global RSWD scale, the subscale of role guilty, and the subscale of role conflict were .86, .85, and .78, respectively. The intraclass correlation coefficients of the global RSWD scale, subscale of role guilty, and subscale of role conflict were .81, .64, and .77, respectively.

Discussion

To the best of our knowledge, this is the first scale that was developed to measure the role strain of women with diabetes. EFA and CFA support that the RSWD scale included two subscales, role guilty and role conflict. The correlation between role guilty and role conflict was lower than 0.9, which indicated the 9-item RSWD scale measured two correlated but distinct constructs.[25] The construct validity of the RSWD scale was supported.

Originally, the RSWD scale was developed to include the positive aspects of role stain, such as role enhancement and role support. However, all items of these positive aspects were deleted after the item analysis, which did not support the Sieber theory.[6] This phenomenon could indicate that the reward from multiple role performance was not an important experience in women with diabetes. Previous role strain scales for women that included the positive aspects were developed for working women and were not specific for women with a chronic disease.[12,14] Further studies are needed to confirm that the reasons for the exclusion of the positive aspects from the RSWD scale are specific to women with diabetes or because of cultural contexts.

The RSWD scale only includes nine items but explains 59.32% of the total variance of role strain in women with diabetes. The RSWD scale is a short but practical measure of role strain in women with diabetes. Role guilty explains 47.15% of the variance of the RSWD scale. Role guilty is the most important experience of role strain in women with diabetes. The items of the subscale of role guilty relate to feelings of embarrassment when one could not fulfill the expected role function. Women with diabetes might still have thoughts to submit themselves to fit the expectations of their significant others. Therefore, when they sacrificed needs of their significant others before they fulfilled their diabetes control role, they felt embarrassed.

In the subscale of role conflict, two items were related to conflict with family members, such as inconsistent opinions in the ways of diabetes control (item 5) and blame from family members because of poor diabetes control (item 7). Our findings supported that family members were a major source of role conflict in women with diabetes, which echoed the finding of a previous qualitative study.[11] Items 6, 8, and 9 measured the conflict in satisfying needs between themselves and significant others, especially in diet control. These three items echoed the findings of previous qualitative studies.[9,10] Women with diabetes were aware that they needed to follow the rules of diet control. Nevertheless, eating food with their family and colleagues is important to maintain family and social relationships in Taiwan. Therefore, they feel role conflict between themselves and their significant others regarding diet control.

According to the mean scores of the RSWD scale, the level of role strain of the participants was not high. Nevertheless, as expected, scores of the RSWD scale significantly correlated with depression and HbA1c levels. The concurrent validity of the RSWD scale was supported. Patients with diabetes experience more depression than people without diabetes.[26,27] Furthermore, the prevalence of depression in women with diabetes was higher than that in men.[28,29] Our findings support that role strain could be considered as a factor associated with depression in women with diabetes. In our study, role strain also reflected on glycemic control in women with diabetes. The influence of role strain on diabetes control in women with diabetes deserves further study.

We found that Cronbach's α of the overall and subscales of the RSWD scale were above 0.7, which

indicates an acceptable internal consistency.[30] The intraclass correlation coefficient of the global RSWD scale and subscale of role conflict was larger than 0.7, which indicates acceptable test-retest reliability. Nevertheless, the intraclass correlation coefficient of the subscale of the role guilty was 0.64. Feeling guilty is a dynamic process that might be unstable and might be affected by context; therefore, the test-retest reliability for the subscale of role guilty was not high. Further studies are needed to confirm this phenomenon.

Some limitations need to be considered in the interpretation of the study. Study participants were recruited from only three hospitals in Taiwan. Further studies should recruit women with diabetes from a bigger variety of hospitals to test the generalizability of the RSWD scale. The participants of our study were limited in age from 20 to 64 years. Further studies should apply the RSWD scale to women older than 65 years to assess the utility of the scale in older women with diabetes. The culture and health care system may also affect the experience of role strain in women with diabetes. Further studies should recruit women with diabetes from diverse cultural backgrounds and types of health care systems to comprehensively assess the generalizability of the RSWD scale.

Traditionally, the influence of gender-specific factors on diabetes control has not been addressed by health care providers. The 9-item RSWD scale is short and has acceptable reliability and validity. The 9-item RSWD has utility for clinical use. Health care providers could apply the 9-item RSWD scale to evaluate the role strain of women with diabetes and provide gender-specific interventions to improve the health of women with diabetes.

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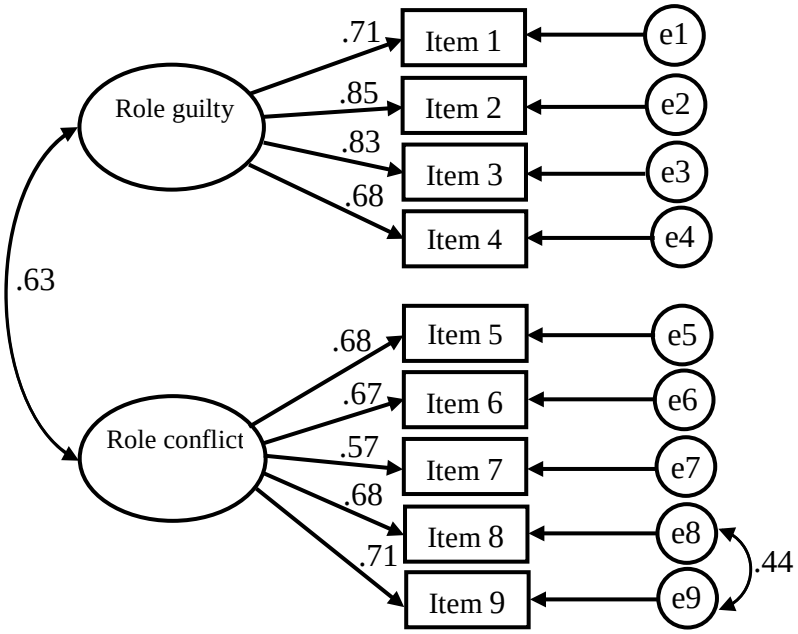


FIGURE.

A two-correlated first-order factor confirmatory factor analysis of the

Role Strain in Women with Diabetes Scale

附件二

科技部補助專題研究計畫成果自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否具有政策應用參考價值及具影響公共利益之重大發現）或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

■ 達成目標

□ 未達成目標（請說明，以 100 字為限）

□ 實驗失敗

□ 因故實驗中斷

□ 其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形(請於其他欄註明專利及技轉之證號、合約、申請及洽談等詳細資訊)

論文：□已發表(??篇) ■未發表之文稿(1 篇) □撰寫中 □無

專利：□已獲得□申請中 ■無

技轉：□已技轉□洽談中 ■無

其他：(以 200 字為限)

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性，以 500 字為限）。

據所知本研究為第一個用來測量糖尿病婦女角色緊張的量表。糖尿病婦女角色緊張量表僅有 9 題，但可以解釋糖尿病女性角色緊張的總變異量 59.32%，具有可接受之信度與效度，是相當簡短且實用的量表。研究發現糖尿病患者比沒有糖尿病者更容易憂鬱；而糖尿病女性的憂鬱症罹患率高於男性，本研究結果支持角色緊張為糖尿病女性憂鬱症的相關因素，且角色緊張也反映在糖尿病婦女的血糖控制上，角色緊張對糖尿病婦女控制糖尿病的影響角色值得未來進一步研究。以往醫療人員並未特別關注性別因素對糖尿病控制的影響，醫療人員可使用 9 題糖尿病婦女角色緊張量表評估糖尿病女性的角色緊張，並運用介入性研究探討減輕糖尿病婦女角色壓力對減輕其憂鬱及血糖控制的成效。

4. 主要發現

本研究具有政策應用參考價值： ■否 □是，建議提供機關_____

(勾選「是」者，請列舉建議可提供施政參考之業務主管機關)

本研究具影響公共利益之重大發現：■否 □是

說明：(以 150 字為限)

附件四

科技部補助專題研究計畫成果彙整表

計畫主持人：王瑞霞	**計畫編號：**MOST 107-2629-B-037-001
計畫名稱：糖尿病婦女角色緊張與疾病控制：量表發展至徑路模式建構(L03)	

成果項目					量化	單位	質化 （說明：各成果項目請附佐證資料或細項說明，如期刊名稱、年份、卷期、起訖頁數、證號...等）
國內	學術性論文	期刊論文				篇	請附期刊資訊。
		研討會論文					
		專書				本	請附專書資訊。
		專書論文				章	請附專書論文資訊。
		技術報告				篇	
		其他				篇	
	智慧財產權及成果	專利權	發明專利	申請中		件	請附佐證資料，如申請案號。
				已獲得			請附佐證資料，如獲證案號。
			新型/設計專利				
		商標權					
		營業秘密					
		積體電路電路布局權					
		著作權					
		品種權					
		其他					
	技術移轉	件數				件	
		收入				千元	1. 依「科技部科學技術研究發展成果歸屬及運用辦法」第 2 條規定，研發成果收入係指執行研究發展之單位因管理及運用研發成果所獲得之授權金、權利金、價金、股權或其他權益。 2. 請註明合約金額。
國	學術性論文	期刊論文				篇	

外		研討會論文			1	2019/7/25-29 Sigma Theta Tau International Honor Society of Nursing, 30th International Nursing Research Congress “Predictors of quality of life in insulin-treated patients: A 9-month prospective study”
		專書				本	請附專書資訊。
		專書論文				章	請附專書論文資訊。
		技術報告				篇	
		其他				篇	
	智慧財產權及成果	專利權	發明專利	申請中		件	請附佐證資料，如申請案號。
				已獲得			請附佐證資料，如獲證案號。
			新型/設計專利				
		商標權					
		營業秘密					
		積體電路電路布局權					
		著作權					
		品種權					
		其他					
	技術移轉	件數				件	
		收入				千元	1. 依「科技部科學技術研究發展成果歸屬及運用辦法」第 2 條規定，研發成果收入係指執行研究發展之單位因管理及運用研發成果所獲得之授權金、權利金、價金、股權或其他權益。 2. 請註明合約金額。
參與計畫人力	本國籍	大專生				人次	
		碩士生					
		博士生			1		黃秋玲
		博士後研究員					
		專任助理			1		學士級專任助理 1 名-林祺
	非本國籍	大專生					
		碩士生					
		博士生					
		博士後研究員					

		專任助理			
其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)					

科技部補助專題研究計畫出席國際學術會議心得報告

日期：108 年 7 月 29 日

計畫編號	MOST107-2629-B-037-001-		
計畫名稱	糖尿病婦女角色緊張與疾病控制：量表發展至徑路模式建構(L03)		
出國人員姓名	王瑞霞	服務機構及職稱	高雄醫學大學護理學院-教授
會議時間	108 年 7 月 25 日至 108 年 7 月 29 日	會議地點	加拿大 卡加利
會議名稱	Sigma Theta Tau International Honor Society of Nursing, 30th International Nursing Research Congress		
發表題目	Predictors of quality of life in insulin-treated patients: A 9-month prospective study		

一、參加會議經過

此次台灣共投稿了 162 篇研究，共有 127 位台灣護理人員參與，7/26 並由國際榮譽護理學會動員舉辦“Taiwan Night”的晚餐活動，邀請國際榮譽護理學會理事長及重要幹部，外交部陳剛毅處長等參與，晚宴成功，可說是一場成功的國民外交，讓國際人士了解台灣護理專業國際事務投入的積極及貢獻。

參加開幕式的特別演講“Improving Peoples’ Outcomes through Evidence-Based Practice: A social Movement Agenda”，陳述由 EBP (Evidence-Based Practice) 轉變成 EBP (Evidence-Based Policy)，透過公共事務及社會運動，賦權健康專業人員創言健康政策。

“Advancing Research Using App-Based Innovations”，陳述利用 App 進行研究的優點為可招募較大樣本數，可擴展由多地方收集資料，能與現有資料進行比較，並且容易取得研究對象的同意書及資料，但其缺點為若研究時間過久，易面臨個案流失、自我報告及生理測量可能會影響效度，演講者也介紹了一些已應用 App 的研究。未來有助於自己進行相關研究。

參與一場由 2019 Emerging Nurse Research Award 得獎者 Ana L. Solano-Lopez 的演講分享其研究歷程，演講者來自 Costa Rica (哥斯大黎加)，論及在其國家根本沒有所謂的護理研究，她是第一代被選派至國外念博士學位的護理人員，雖然她在 Case Western Reserve University 拿到博士學位，但回國後面臨的問題為沒有時間、沒有 mentor、沒有預算、沒有研究的規範(如 IRB)，很難想像一個國家作研究是那麼困難，研究也是會面臨不平等的問題。之後其他時間則逐一瀏覽海報

二、與會心得

總而言之，這次主題較偏向實證照護及護理教學方面的演講及海報，在專業收穫比較不是那麼廣泛。但卻也認識更多國內外的護理專家，也激發了一些研究的想法，有助於未來研究方向及規劃。

三、發表論文全文或摘要

Purpose: Quality of life (QoL) of insulin-treated patients with type 2 diabetes (T2DM) was found to worsen than those treated by oral drug-treated patients. Understanding predictors of subsequent QoL will help design effective interventions to improve QoL in insulin-treated patients. This study aims to understand predictors of QoL across 9 months.
Methods: This study adopted a 9-month observational study design. Overall, 183 insulin-treated patients with T2DM were recruited from two endocrinology clinics in Taiwan by convenience sampling. At baseline, a self-reported questionnaire was used to collect demographic and disease characteristics, regimen adherence factors (adherence in frequency of insulin injection and self-monitoring blood glucose), and psychosocial factors (decisional balance for insulin injection, health literacy, self-efficacy for insulin injection, diabetes distress, empowerment perceptions, and quality of life). HbA1c levels at baseline were collected from medical records. QoL was measured at baseline and 9 months later.
Results: The mean age of participants was 55.52 (SD=11.1). Most participants were male (n=114, 62.3%). In bivariate correlation analysis, baseline age (r=0.209, p=0.002), duration of diabetes (r=0.171, p=0.010), adherence in frequency of insulin injection (r=-0.180, p=0.007), decisional balance for insulin injection (r=0.235, p=0.001), self-efficacy (r=0.287, p<0.001), and diabetes distress (r=-0.528, p<0.001) were significantly correlated with 9-month QoL. Gender (r=0.027, p=0.359), HbA1c levels (r=-0.082, p=0.134), duration of insulin injection (r=0.062, p=0.201), adherence in self-monitoring blood glucose (r=-0.029, p=0.350), health literacy (r=0.055, p=0.228), empowerment perception (r=0.084, p=0.128) were not significantly correlated with 9-month QoL. After adjusting baseline QoL, multiple regression indicated that age (β=0.189, p=0.012), adherence in frequency of insulin injection (β=-0.133, p=0.04), diabetes distress (β=-0.286, p=0.004) were important predictors of 9-month QoL and explained 34.0% variance of 9-month QoL.
Conclusion. Results supported that patients with younger age should be considered a risk group for developing poor QoL. The higher the diabetes distress at baseline, the poorer the QoL 9 months later. Regularly assessing diabetes distress and providing early intervention is necessary for insulin-treated patients. Insulin-treated patients who more adhere to established frequencies of insulin injection might perceive high stress because of more interruption of daily activities; finally, leading to developing poor QoL. Therefore, healthcare providers should educate insulin-treated patients how to balance the schedules of insulin injections in their daily lives.
Key words: quality of life, insulin-treated patients, predictors, prospective study

ABSTRACT SUMMARY: This study provides information regarding predictors of QoL in insulin-treated patients across 9 months. Participants who are interested in caring for insulin-treated patients are welcome to participate.

I. Introduction:

Quality of life (QoL) of insulin-treated patients with type 2 diabetes (T2DM) was found to worsen than those treated by oral drug-treated patients. Understanding predictors of subsequent QoL will help design effective interventions to improve QoL in insulin-treated patients.

II. Body:
Age (β=0.189, p=0.012), adherence in frequency of insulin injection (β=-0.133, p=0.04), diabetes distress (β=-0.286, p=0.004) were important predictors of 9-month QoL and explained 34.0% variance of 9-month QoL.

III. Conclusion:
1. Younger age should be considered a risk group for developing poor QoL.
2. Regularly assessing diabetes distress and providing early intervention is necessary for insulin-treated patients.
3. Healthcare providers should educate insulin-treated patients how to balance the schedules of insulin injections in their daily lives.

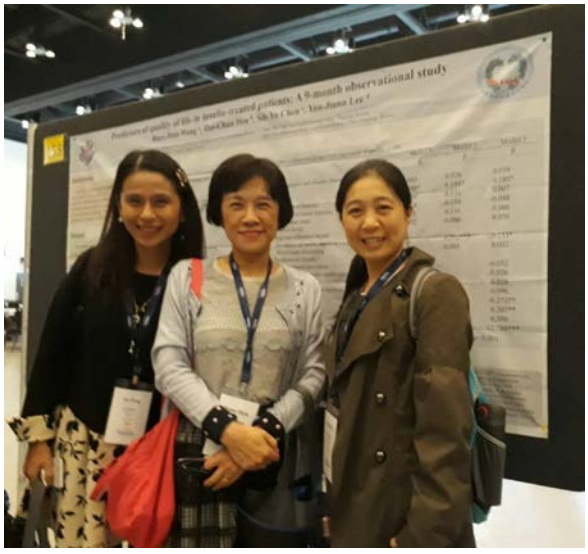
四、建議

無

五、攜回資料名稱及內容

大會手冊

六、其他



	 KET PICKUP 2019/7/26
	 Sigma

107年度專題研究計畫成果彙整表

計畫主持人：王瑞霞	**計畫編號：**107-2629-B-037-001-
計畫名稱：糖尿病婦女角色緊張與疾病控制：量表發展至徑路模式建構(L03)	

成果項目			量化	單位	質化 （說明：各成果項目請附佐證資料或細項說明，如期刊名稱、年份、卷期、起訖頁數、證號...等）
國內	學術性論文	期刊論文	0	篇	
		研討會論文	0		
		專書	0	本	
		專書論文	0	章	
		技術報告	0	篇	
		其他	0	篇	
國外	學術性論文	期刊論文	0	篇	
		研討會論文	1		2019/7/25-29 Sigma Theta Tau International Honor Society of Nursing, 30th International Nursing Research Congress “Predictors of quality of life in insulin-treated patients: A 9-month prospective study”
		專書	0	本	
		專書論文	0	章	
		技術報告	0	篇	
		其他	0	篇	
參與計畫人力	本國籍	大專生	0	人次	
		碩士生	0		
		博士生	1		黃秋玲
		博士級研究人員	0		
		專任人員	1		學士級專任助理1名-林祺
	非本國籍	大專生	0		
		碩士生	0		
		博士生	0		
		博士級研究人員	0		
		專任人員	0		

其他成果 （無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。）	