Predicting Type 2 Diabetes Care Results with Social Psychological Factors

Pan Yen-Chu[1] and Shiow-Luan Tsay[2*]

[1]*Chief Nursing Officer, St. Martin De Porres Hospital, Taiwan*

[2*]*PhD, Professor, College of Nursing and Health Sciences, Da-Yeh University, Dacun, Changhua 51591, Taiwan*

*****Corresponding author**
Shiow-Luan Tsay, PhD, Professor, College of Nursing and Health Sciences, Da-Yeh University, Dacun, Changhua 51591, Taiwan, Tel: 886+ 4-8511888; E-Mail: sltsay0308@gmail.com

Abstract

The prevalence rate of diabetes is very high in Taiwan that poses a serious threat to the health of people. Patients' physical and psychosocial factors always have an impact on the treatment results. However, this issues have not been extensively discussed in previous researches. The purpose of this study is to investigate the effects of socio-psychological factors on the care outcomes of Type 2 diabetes. The study is a descriptive and correlation design; Instruments included a basic information form, Social Support Scale, Chinese version of Patient Health and Depression Questionnaire, Perceived Stress Scale, and Health-related Quality of Life Scale. The analysis methods included descriptive statistics, independent-sample t-test, one-way ANOVA, Pearson product-moment correlation, multiple linear regression, and binary logistic regression. The sample consisted of 133 patients.

Results showed, depression is significantly negatively related to social support (r=-0.27, p<.05), psychological distress is significantly negatively related to social support (r=-0.21, p<.05), psychological distress is significantly positively related to depression (r=0.85, p<.01), quality of life is significantly negatively related to depression (r=-0.64, p<.01) and psychological distress (r=-0.59, p <.01).

Continuous outcome variables are analyzed using regression analysis, depression and economic independence jointly explained 32.1% of variance in the physical aspect of quality of life (27.9% by depression and 4.2% by economic independence). Depression and psychological distress jointly explained 61.3% of variance in the psychological aspect of quality of life (59% by depression and 2.3% by psychological distress). Economic dependence on others explained 3.1% of variance in the number of hospital stays. Depression explained 3.7% of variance in the number of emergency department visits. Education level explained 4.3% of variance in the number of complications. Categorical outcome variables are analyzed using binary logistic regression, ducation has a significant effect on average glucose level over the last year (p>.03). Depression has a significant effect on both the last HbA1c level (p<.05) and average glucose level over the last year (p>.03). Results of this study suggest that when providing clinical care to diabetes, nurses should also consider the effects of socio-psychological factors on the care outcomes and provide necessary counseling and treatment of depression to enhance the effectiveness of care.

Introduction

Research motivation and importance

Diabetes is a global problem. Type 2 diabetes accounts for about 90% to 95% of all diabetes classifications. In recent years, Taiwan is rapidly moving towards an aging society. Due to continuously social and economic development, lifestyle and diet patterns also follow. Changes, the incidence of derived chronic diseases increased year by year. Diabetes is the most common chronic disease, and its incidence is rapidly rising. The number of people suffering from diabetes is estimated by the International Diabetes Federation in 2013 and by 2035, the number of people suffering from diabetes will increase from 380 million to 590 million people, and the prevalence rate will increase from 6.4% to 7.7%.

Type 2 diabetes is predominant in Taiwan for 95% of all diabetics [1]. Statistics from the Ministry of Health and Welfare (2014), the top ten causes of death in Taiwan are chronic diseases, and diabetes is ranked fifth in the cause of death [2]. Based on statistical results, the number of deaths from chronic diseases accounted for 77.5% of the total deaths.. It can be seen that diabetes imposes a great burden on social cost expenditures, Far-reaching health effects. Severe complications can lead to kidney failure, blindness, amputation, and even life or death [3].

The Ministry of Health and Welfare (2014) National Health Insurance Top 20 indicators of medical expenses, diabetes ranked third, accounting for 4.1% of medical expenses, up 5.2%, found in the health insurance data, diabetes outpatient expenses accounted for all 5.5% of medical expenses, an increase of 8.5%, also climbed to third place from the fifth place in 2013 [2]. The average length of stay for diabetics is approximately 10.83 days per person, and the cost of hospitalization is also considerable.

People with diabetes often have to endure lifelong illnesses, resulting in negative emotions, especially physical and mental health [3]. Negative emotions may also be due to the fact that diabetes can only be controlled, cannot be eradicated, and has an intangible influence on the patient's heart fear and disease threat. In other words, the higher the emotional distress, the worse the quality of life [4]. In recent years, the assessment of diabetes care outcomes can be measured by mortality and clinical trial results. The average duration of diabetes is more than 10 years. Therefore, we should pay attention to the impact on quality of life. If family or friends can provide ongoing support, it can reduce depression and increase control of the disease and reduce emotional distress (Kim et al., 2015). If diabetic patients have good medical communication, social support, and self-care behavioral factors are directly related to glycemic control [5]. From the above, it can be seen that many of the results of psychosocial factors affecting diabetescare and nursing are related to psychosocial research. Research has often focused on specific social or psychological aspects related to diabetes, and few studies have investigated the complete psychosocial aspects of treatment outcomes. Through research and discussion, the expected results can provide important predictors of psychosocial factors in nursing outcomes, develop interventions for predictors of important outcomes, and provide appropriate care to diabetic patients to improve patient care outcomes.

Document verification
Disease prevalence of diabetes
According to the statistics of the Ministry of Health and Welfare (2016), the top ten causes of death in Taiwan are mainly chronic diseases, with malignant tumors continuing to rank first and diabetes ranking fifth [6]. According to the National Health and Nutrition Administration (MOHW) from 2013 to 2015, the survey on changes in the national nutrition and health status found that the prevalence of diabetes over the age of 18 years was 11.8% (13.1% for men and 10.5% for women), and about 2.27 million 5,267 Famous people suffer from diabetes, and it is estimated that there will be an increase of about 25,000 new rickets each year. Men will increase with age to 44.5% of the age group above 65. Women will also increase in popularity with age, and will increase at a faster rate. To the age of 65 and above, 57.3% of women suffer from metabolic syndrome, and the prevalence of men and women has a cross-over trend. Type 2 diabetes-related complications include microcirculatory disturbances, neuropathy of macrovascular circulation and nephropathy, including sensory, motor, and autonomic neuropathy, peripheral vascular disease of the lower extremities, poor immune function, and impaired wound healing; some scholars believe that Diabetics need effective self-management to prevent the disease from worsening [7]. Diabetic patients are more likely to have high blood pressure, heart disease, kidney disease, peripheral vascular disease, neuropathy, and retinopathy than normal people [8]. For diabetic patients, they need continuous self-monitoring of blood sugar, diet control, medications, and exercise to effectively control

the disease and prevent the progression or worsening of symptoms [9]. Diabetes significantly increases the risk of cardiovascular disease. Patient-centered care approaches should include controlling blood pressure and fat control, preventing smoking and assisting smoking cessation, weight management, exercise control, and healthy lifestyles to reduce the risk of cardiovascular disease [10]. Social support is defined as the transmission of information from two or more peopleso that social supporters can feel comfortable and can help maintain a high quality of life. Diabetes is often accompanied by depression. Many studies have shown that depression increases insulin secretion, leading to an increased risk of type 2 diabetes. The study of the incidence of depression found that the incidence of depression in diabetic patients increased [11, 12].

Social psychological factors related to diabetes
Stress is a potential contributor to chronic hyperglycemia in diabetes. When the individual feels stress, it will stimulate the brain to begin to secrete stress hormones, such as cortisol, glucagon, and/or adrenal hormones. Both psychological and physiological pressures will promote the secretion of stress hormones, which will directly affect blood glucose levels. Blood glucose changes [13]. The source of stress in diabetes is mostly from spouses, and spousal stress can affect self-efficacy leading to changes in the number and compliance of diabetic comorbidities (J. R. Anderson et al., 2016). Regardless of gender, stress and depression are positively correlated with insulin resistance [8]. There are many psychological factors that affect people with diabetes who have non-positive emotions. The process of rickets tends to face a series of psychological shocks, including negative emotions such as denial of illness, depression, and anxiety. The higher the degree of psychological pain caused by diabetes, the more blood sugar is controlled. The worse [14]. The death rate of people suffering from diabetes was 1.8 times higher than that of patients with cardiovascular disease, and the risk of cardiovascular disease was 1.7 times higher. Among those who were found and treated early, those with psychological stress at the time of diagnosis had a higher heart than people without psychological stress. Risk of vascular disease and risk of death [15]. The impact of diabetes on personal life varies from person to person. The daily activities related to diet control, exercise control, blood glucose control, drug control, daily routines, etc., usually bring varying degrees of distress. Factors related to depression in people with diabetes [16].

Diabetes care simulation
Changes in blood glucose are not easy to detect and must be self-monitored on a regular basis. When glycated hemoglobin is close to or greater than 10.0%, fasting blood glucose is expected to rise to 7%, indicating that pre-meal glycemic control needs to be enhanced, or supplementation and adjustment of insulin to help control blood glucose.

Glycated hemoglobin is the main reaction, and the degree of diabetes blood glucose control is good. Still bad, and the chance to anticipate diabetic complications [17]. When the glycated hemoglobin value is greater than or equal to 6%, it is a high-risk group that develops diabetes [18].

Diabetes and quality of life
Diabetes is diagnosed until it dies and it takes decades. There is a need for effective medical treatment of diabetic patients to improve long-term prognosis. Scholars suggest that life is the goal of quality setting. The higher the compliance with diabetes drug prescriptions,

the better the quality of life. The predictive factors of the specific quality of life of diabetes are related to the economic status of the patient. Most of the literature found that type 2 diabetes is a common chronic disease in modern advanced countries. Under the influence of changes in social patterns, even if medical technology progresses, the treatment of diabetes cannot be eradicated. The longer the duration of diabetes is affected, the greater the number of complications that may occur [19].

Research Methods
The research structure is as follows (see Figure 1 for details)
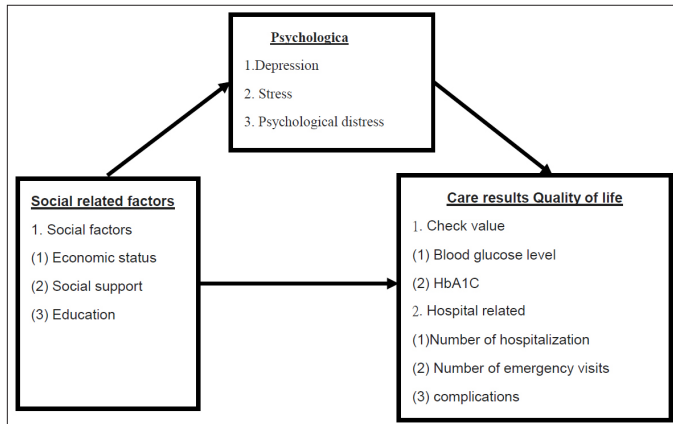

Figure 1: Research Conceptual Architecture

During the formal trial, from January 4, 2017 to June 30, 2017, a total of six months, the study was conducted in a cross-sectional study. Samples will be collected conveniently and the number of samples will be used. Based on the purpose of this study, the total number of samples required to be collected will be 92 with the loss rate of 20 and there are 111. questionnaires need to be sent (Figure 2). Research tools use structured questionnaires to collect data. The questionnaire used in this study was based on the author's forensic license. Steps and data collection processes, such as applying for a research review board, IRB review.
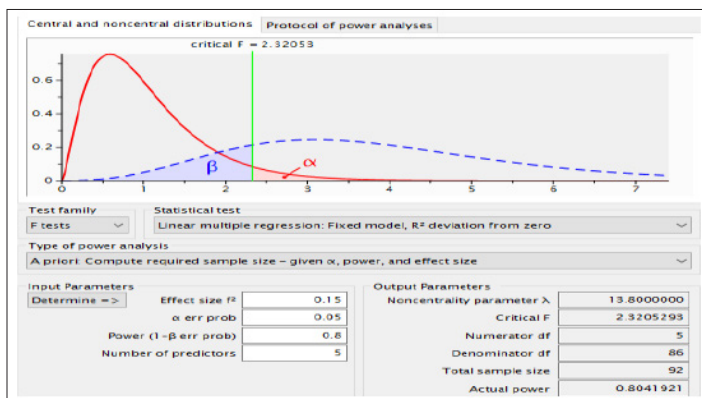

Figure 2: Estimated Sample Size

Research Result
In this study, 200 diabetes patients who met the conditions for selection were invited to participate in the study. 150 people agreed to complete the questionnaires. The final effective sample was 133 people. The results of this chapter contain the following descriptions:

Demographic Structure Variables
Most of the studied subjects are married women. The age distribution is concentrated around 60-69 years old. The educational level is mainly in the elementary and junior high schools. The majority of the main economic sources come from individuals, and the most religious beliefs are Taoism. The age of rickets was the highest in 5-10 years.

Research Variable Description
Conclusion
The score of social support scale is between 13-65 points, the average social support score of the participants is 40.08; the score of depression scale is 10-14 points, there is mild depression, 15-19 points of moderate depression, 20 points The above is severe depression, with an average score of 15.53 on the Depression Scale and distribution of depression (Table 1): 16.5% for melancholia, 54.1% for mild depression, 20.3% for moderate depression, and 9% for severe depression; The average stress score was 42.07; the psychological pain scale, the higher the score, the greater the psychological pain index, the average score of the participants' psychological pain scale was 3.16, which was a good range; the quality of life table, 50 was divided into norm,Out of 100 scores, the higher the score, the better the quality of life. Subjects' quality of life score averages 70-77 points.

Table 1: Table of Melancholy Distribution (N=133)

Variability Degree (n)	Percentage	(%)
Melancholy No depression	22	16.5
Mild depression	72	54.1
depression		
Moderate depression	27	20.3
Severe depression	12	9.0

Study the relevance of variables
According to the results of Pearson's relevant tests (Table 2), social support and psychological factors and quality of life of type 2 diabetes are related.

Table 2: Pearson Correlation Checklist for Socio-Psychological Factors (N=133)

Variability	1	2	3	4	5
1. Social support	1				
2. Depression	-0.271**	1			
3. Stress	0.078	-0.128	1		
4. Psychological distress	-0.218*	0.852**	-0.156	1	
5. Quality of life	0.123	-0.642**	0.143	-0.596**	1

*$p<0.05$; **$p<0.01$; ***$=p<0.001$*

Correlation between social psychological factors and treatment outcomes
Using the linear regression analysis results (Table 3), the overall model explained 32.1% of the variance of the quality of life in the physiological aspect, in which depression explained 27.9%, while economic self-sufficiency explained 4.2%, and depression affected the quality of life. The explanation is great. The more depressive (β=-

.53, $p<.001$) or economically incapable ($\beta=.21$, $p=.005$) diabetics, the worse their quality of life is.

Table 3: Linear Regression Analysis of Impact of Social Psychological Factors on Quality of Life (Physiology) (N=133)

Model	R	R^2	$R^2\triangle$	p
1. Depression	.528ᵃ	.279	.279	<.001***
2. Depression、Economic self-sufficiency	.566ᵇ	.321	.042	.005***

*p<0.05; **p<0.01; ***=p<0.001*

Linear regression analysis showed (Table 4) that the more depressive ($\beta=-.77$, $p<.001$)

or psychological ($\beta=-.29$, $p=.006$) diabetic patients, their quality of life psychological facet The worse.

Table 4: Regression Analysis of Social Psychological Factors on Quality of Life (Psychological Level) (N=133)

Model	R	R^2	$R^2\triangle$	p
1. Depression	.76	.590	.590	<.001***
2. Depression、Psychological distress	.78	.613	.023	.006*** *p<

*p<0.05; **p<0.01; ***=p<0.001*

Based on the results of linear regression analysis (Table 5), the economy of the overall model relied on others to explain 3.1% of the variance. Diabetics are economically dependent on others ($\beta=-.18$, $p=.04$) and the fewer hospitalizations they have.

Table 5: Regression analysis of the influence of social psychological factors on hospitalization times (N=133)

Model	R	R 2	$R^2\triangle$	p
1. Economic dependence on others	.17	.031	.031	.043*

*p<0.05; **p<0.01; ***=p<0.001*

Using linear regression analysis results (Table 6), the overall pattern of depression accounted for 3.7% of the number of emergency visits. The more depressed patients with diabetes ($\beta = .19$, $p = .02$), the higher the number of emergency visits.

Table 6: Regression Analysis of the Impact of Social Psychological Factors on Emergency Times (N=133)

Model	R	R^2	$R^2\triangle$	p
1. Depression	.192ᵃ	.037	.037	.027*

*p<0.05; **p<0.01; ***=p<0.001*

Using the linear regression analysis results (Table 7), the education level of the overall model explained the variation of 4.5% complications. The higher the degree of education for people with diabetes ($\beta = -.21$, $p = .01$), the fewer the number of complications.

Table 7: Linear regression analysis of the influence of social psychological factors on the number of complications (N=133)

Model	R	R^2	$R^2\triangle$	p
1. education	.211ᵃ	.045	.045	.015*

Discussion

In the literature of this study and validation, the population distribution of patients with type 2 diabetes in domestic literature did not differ in terms of gender distribution, age distribution, education distribution, marital status distribution, r time, and comparison. The influence of changes in social patterns and family models in Taiwan led to the majority of participants expressing their ability to handle their own health. The improvement was on their own, leading to a lower average score for social support. The mean depression score for this study was 15.53 points, and the average stress response score for this study was 40.07 points. In an outpatient study, the experimental group found that the role of stress management in glycemic control in patients with type 2 diabetes was significantly associated with improvements in glycemic hemoglobin scores (p = .05) and their pressure management. The quality of life of the study was at a physiological/psychological average of 70 to 77 points. The quality of life scores obtained in this study showed that the quality of life of the test population was good and the quality of life measured abroad by SF-12 was compared. There was a significant correlation between health-related quality of life and physiological levels (r = 0.678; p.001) and psychological levels (r = 0.211; p.009). Ratings are scored based on gender and birth/heart level scores. This study found that the quality of life is significantly associated with depression and psychological pain. It can be seen that negative emotions can change the quality and quantity of quality of life. Mental health, subjective well-being and quality of life were significantly improved. Linear regression analysis of continuous variables found that the number of people dependent on the economy and the number of hospital admissions was variable. When the economic situation is provided by others, the hospitalization rate is higher, and the predictive ability of economic depression. Among them, the number of depressions and emergencies was found to be variable. The higher the depression score, the more emergency medical visits. The educational level of the study participants was generally small, followed by high school education, which affected the number of diabetes-related complications and the low level of education occurred at the same time. increase the amount. The binary logistic regression analysis of the categorical variables showed that the educational level had a significant effect on the average blood glucose level (p.03); depression was the last glycated hemoglobin value (p <0.05) and the annual mean glycohemoglobin value (p> 0.03) has a significant effect. Patients with a high degree of depression may have annual average hemoglobin values that are 1.24 times higher than those with a lower degree of depression. Depression affects the influencing factors of important care outcomes in patients with type 2 diabetes.

Conclusion

After reviewing the relevant literature, understand diabetes risk factors including obesity, hypertension, dyslipidemia and family history. In addition, sociodemographic, economic, psychological, environmental factors, and diabetes control were associated with health outcomes [18]. The research results show that social and psychological factors have a great influence on the outcome of diabetes care. Based on the results of the comprehensive study, the following recommendations are made:

1. It is recommended that diabetic patients with unsatisfactory glycemic control assess the degree of depression to assist in treatment and assist in disease control.
2. The clinical response to depression in diabetics should be different. Depression requires proper diagnosis and attribution, correct assessment, and assistance in determining the direction of treatment.
3. For patients with type 2 diabetes who have a longer period of illness and older age, they should strengthen the power of education and home services to provide counseling improvement of the blood glucose control and glycated hemoglobin values in order to prevent the occurrence of diabetes. Complications are the most important at improvement of life quality
4. Patients with type 2 diabetes are encouraged to participate in support groups or patient groups, use peers or family members to provide support to relatives or friends, or use trust relationships between diabetes managers and patients to help them seek social needs and care and support in the healthcare system.
5. There are many depression assessment scales for the application of diabetes at home and abroad, but unfortunately it has not been used clinically. Therefore, it is recommended that diabetics be able to evaluate depression using a highly reliable and effective depression assessment scale, and I believe there will be benefits for the disease control of diabetes [20, 21].

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