Factors Predicting Health-Related Quality of Life in Patients with Type 2 Diabetes in Myanmar*

Mi Khaing Yin Mon[1], Aurawamon Sriyuktasuth, RN, DSN[1], Chongjit Saneha, RN, PhD[1]

Abstract

Purpose: To investigate the predictive power of gender, type of treatment, comorbidity, and social support on health-related quality of life in patients with type 2 diabetes in Myanmar.

Design: Correlational predictive study.

Methods: A total of 100 patients with type 2 diabetes diagnosed for at least six months and came to follow-up at the Diabetes Clinic, Yangon General Hospital, Myanmar were recruited in the study. The research instruments included demographic data form, the WHO's Quality of Life Brief questionnaire (WHOQoL-BREF), the Social-Support Questionnaire, and the Charlson Comorbidity Index (CCI). Data were analyzed with descriptive statistics and multiple regression analysis.

Main findings: The findings showed that the participants mean age was 52.82 years (SD = 11.86). Overall, the participants had mild comorbidity ($\overline{X}$ = 1.45, SD = 1.04) and perceived moderate levels of social support ($\overline{X}$ = 19.31, SD = 5.26) and health-related quality of life ($\overline{X}$ = 77.92, SD = 11.40). In multiple regression analysis, gender, type of treatment, comorbidity, and social support jointly accounted for 16.2% of the variance in overall health-related quality of life (R^2 = .162, $F_{(4,95)}$ = 4.593, $p < .001$). Social support was the most important predictor of health-related quality of life (β = .298, p = .002), followed by female gender (β = -.211, p = .029).

Conclusion and recommendations: Worsen quality of life among type 2 diabetes patients in Myanmar could be predicted by low social support and female gender. Nurses and health care personnel should assess the patients' needs for support in order to provide them supportive services during clinic visits. It is also important to pay attention to services provided to women with diabetes to optimize their quality of life.

Keywords: diabetes mellitus type 2, health-related quality of life, Myanmar, sex, social support

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Corresponding Author: Associate Professor Aurawamon Sriyuktasuth, Faculty of Nursing, Mahidol University, Bangkok 10700, Thailand; e-mail: aurawamon.sri@mahidol.ac.th

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[1] Faculty of Nursing, Mahidol University, Bangkok, Thailand

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ปัจจัยทำนายคุณภาพชีวิตด้านสุขภาพในผู้ป่วยเบาหวานชนิดที่ 2 ในประเทศเมียนมาร์*

Mi Khaing Yin Mon[1] อรวมน ศรียุกตศุทธ, DSN[1] จงจิต เสน่หา, PhD[1]

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาอำนาจการทำนายของตัวแปรเพศ ชนิดการรักษา โรคร่วม และการสนับสนุนทางสังคมต่อคุณภาพชีวิตด้านสุขภาพในผู้ป่วยเบาหวานชนิดที่ 2 ในประเทศเมียนมาร์

รูปแบบการวิจัย: การศึกษาความสัมพันธ์เชิงทำนาย

วิธีดำเนินการวิจัย: กลุ่มตัวอย่างเป็นผู้ป่วยโรคหวานชนิดที่ 2 จำนวน 100 ราย ที่ได้รับการวินิจฉัยมาแล้วอย่างน้อย 6 เดือน และมาติดตามการรักษาที่คลินิกเบาหวาน โรงพยาบาลย่างกุ้ง ประเทศเมียนมาร์ เครื่องมือวิจัยประกอบด้วย แบบสอบถามข้อมูลส่วนบุคคล แบบสอบถามคุณภาพชีวิต แบบประเมินการสนับสนุนทางสังคม และแบบประเมินภาวะโรคร่วม วิเคราะห์ข้อมูลโดยใช้สถิติพรรณา และสถิติถดถอยพหุคูณ

ผลการวิจัย: กลุ่มตัวอย่างมีอายุเฉลี่ย 52.82 ปี (SD = 11.86) โดยรวมมีภาวะโรคร่วมในระดับน้อย ($\overline{X}$ = 1.45, SD = 1.04) มีการรับรู้การสนับสนุนทางสังคม ($\overline{X}$ = 19.31, SD = 5.26) และคุณภาพชีวิตในระดับปานกลาง ($\overline{X}$ = 77.92, SD = 11.40) ตัวแปรอิสระทุกตัวสามารถร่วมกันทำนายคุณภาพชีวิตได้ร้อยละ 16.2 (R^2 = .162, $F_{(4,95)}$ = 4.593, p < .001) โดยการสนับสนุนทางสังคมเป็นปัจจัยทำนายคุณภาพชีวิตที่สำคัญที่สุด (β = .298, p = .002) รองลงมา คือ เพศหญิง (β = -.211, p = .029)

สรุปและข้อเสนอแนะ: คุณภาพชีวิตที่แย่ลงของผู้ป่วยเบาหวานชนิดที่ 2 ในประเทศเมียนมาร์สามารถทำนายได้จากการสนับสนุนทางสังคมที่ต่ำ และเป็นผู้ป่วยเพศหญิง พยาบาลและบุคลากรสุขภาพควรประเมินความต้องการการสนับสนุนทางสังคมของผู้ป่วย และให้การบริการที่สนับสนุนความต้องการ โดยเฉพาะในผู้ป่วยเพศหญิง เพื่อเพิ่มระดับคุณภาพชีวิตด้านสุขภาพให้แก่ผู้ป่วยเบาหวานชนิดที่ 2

คำสำคัญ: โรคเบาหวานชนิดที่ 2 คุณภาพชีวิตด้านสุขภาพ ประเทศเมียนมาร์ เพศภาวะ การสนับสนุนทางสังคม

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Corresponding Author: รองศาสตราจารย์อรวมน ศรียุกตศุทธ, คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล บางกอกน้อย กรุงเทพฯ 10700, e-mail: aurawamon.sri@mahidol.ac.th

** วิทยานิพนธ์หลักสูตรพยาบาลศาสตรมหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ และบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล*

[1] คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

Background and Significance

Diabetes mellitus (DM) is a major health problem that leads to causes of death and disease burden worldwide. Globally, in 2014, 422 million adults aged over 18 years were living with diabetes[1]. Most of people with diabetes are living in low and middle-income countries[2]. Recent estimates suggest that the prevalence of DM in the South-East Asia region, including Myanmar has been rising. By the year 2014, 10.5 % of Myanmar population aged 25 to 65 years old have suffered from diabetes[3]. It was estimated that the number of adults with diabetes in Myanmar will rise up to 1,755,000 in the 2030[4].

DM is a chronic condition that leads to development of severe complications, such as lower limb amputation, blindness, kidney disease, and cardiovascular diseases. Living with diabetes limits the capacity of individuals to live well; and it affects their health-related quality of life (HRQoL) in all aspects including physical, psychological, social, and environmental aspects. People with diabetes typically experience dietary restrictions and lifelong medication. In addition to life style changes, diabetes-related complications are considered to have major impacts on poor HRQoL. Previous studies conducted in many countries indicated that patients with type 2 diabetes (T2DM) reported their HRQoL as poor to moderate[5-7]. Two previous studies from Myanmar also reported poor to moderate levels of HRQoL in patients with T2DM[8-9].

Zhan 's Quality of Life (QoL) model[10] was used to guide the present study. According to the model, factors influencing individuals' quality of life are categorized into three factors as personal background factors, health-related factors, and socio-cultural-environmental factors[10]. Based on the QoL model, gender is applied as one of the personal background factors. Several studies had shown that gender was significant predictor of HRQoL in patients with T2DM.

However, some inconsistent findings were found. A study from China[11] found that female was a predictor of poorer HRQoL among patients with T2DM. On the other hand, the studies from Malaysia[12] and Greek[13] reported that gender was not a predictor of HRQoL in their studies.

Type of treatment and comorbidity are categorized as health-related factors in the QoL model. Studies reported on the influence of type of treatment and HRQoL indicated mixed results. According to the previous studies[11,14-16], taking combined oral medications and insulin treatment or only insulin use was significantly associated with poorer HRQoL and other health outcomes in patients with T2DM. Using insulin could lower HRQoL because of its inconvenience and adverse effects. However, one of the studies from Bangladesh[7] indicated that type of treatment had no predictive power on HRQoL. Interestingly, the two previous studies in Myanmar also reported that no relationship between type of treatment and HRQoL in patients with T2DM[8-9]. Further, the results from previous studies supported that comorbidity was a predictor of HRQoL in T2DM patients[5,11]. However, no previous research in Myanmar that examined the association between comorbidity and HRQoL was found.

Social support is categorized into socio-cultural-environmental factors. Several studies from many countries such as the United Arab Emirates (UAE)[6], China[17], and France[18] had shown positive effect of social support to improve HRQoL in patients with T2DM. However, previous studies in Myanmar found no relationship between social support and HRQoL[8-9].

Evidently, numerous studies were conducted to examine HRQoL and its predictors among patients with T2DM in various countries. However, mixed results have been found. To date, only two previous studies in Myanmar were conducted to investigate level

of QoL among people with T2DM[8-9]. No published studies have examined factors predicting the HRQoL of patients with T2DM in Myanmar. Additional study is needed to understand those predicting factors. Therefore, the researchers were inspired to examine predictive power of gender as personal background factor, type of treatment and comorbidity as health-related factors and social support as socio-cultural-environmental factor on HRQoL. The findings from this study could yield the information necessary for nurses and health care teams to develop preventive services to improve HRQoL in patients with T2DM in Myanmar.

Objectives

To investigate the predictive power of gender, comorbidity, type of treatment, and social support on HRQoL in patients with T2DM in Myanmar.

Hypothesis

Factors including gender, type of treatment, comorbidity, and social support could predict HRQoL in patients with T2DM in Myanmar.

Methodology

This study was a correlational predictive study.

Population and Sample

The population of this study was patients with T2DM both male and female, aged above 18 years old who came to follow-up at the Diabetes Clinic, Yangon General Hospital. The patients who had been diagnosed T2DM for at least six months and could communicate with Myanmar language were included in this study. In addition, those patients who had severe conditions such as heart failure functional class IV and were diagnosed with mental illness were excluded from the study.

The sample size was calculated using power analysis based on the effect sizes of previous studies[6,12] in which the effect sizes ranged from .13 to .25. The researchers chose medium effect size (f^2 = .15) to calculate the sample size in this study. G* power software[19] was used for the calculation of sample estimation based on α value of .05, the power of .85, the effect size of .15 and the four independent variables. A minimum sample of 95 subjects was required. As aimed at an appropriate number of sample size, the data were collected from 100 subjects.

Research Instruments

1. WHO's Quality of Life Brief questionnaire (WHOQoL-BREF) Myanmar version was used to measure the HRQoL in the current study. The original version developed by World Health Organization group was translated into Myanmar version[20]. The questionnaire comprises 26 items with 5-point Likert-type scale. The scale is divided into four domains including physical health, psychological health, social relationship, and environmental domains. The response options range from 1 (very dissatisfied/very poor) to 5 (very satisfied/very good). A total score of the overall HRQoL ranges from 26 to 130; and a high score indicates good HRQoL.

2. Social-Support Questionnaire Myanmar version modified for patients with T2DM by Nay Zaw Htet[8] was used to measure social support in this study. The original version was developed by Sarason, et al[21]. The scale covers the support from family, friends and health personnel. Total 15 items with a 3-point Likert-type scale range from "Never" (0) to "Always" (2). A possible total score ranges from 0 to 30; a higher score indicates better social support. Poor social support scores range between 0-17; moderate scores range between 8-23; and good social support ranges from 24-30.

3. Charlson Comorbidity Index (CCI) Myanmar version was used to examine the participants' comorbidity conditions. CCI original version was developed by Charlson, et al[22]; and Myanmar version was translated and modified for patients with T2DM by Lwe Say Paw Hla[23]. The scale consists of 12 categories

including cardiovascular diseases, cerebrovascular disease, pulmonary disease, diabetes with chronic complications, kidney disease, dialysis, renal transplant, liver disease, peptic ulcer disease, cancer, rheumatic disease, AIDS/HIV, skin ulcers/cellulites, and depression. A possible total score ranges from 0 to 38 with a higher score indicating more severe comorbidity. A total score is classified into one of the four categories of comorbidity severity as no (score = 0), mild (score = 1-2), moderate (score = 3-4), and severe (score ≥ 5).

4. The demographic data record form developed by the researchers was used to collect the participant's personal and clinical information.

5. General Practitioner Assessment of Cognitive (GPCOG) Myanmar version was used as a screening tool to assess the cognitive level of the sample aged over 60 years. The original version developed by Brodaty, et al[24] was modified and translated into Myanmar version by Lwe Say Phaw Hla[23]. The scale includes 9 items to assess time orientation, information, recall test, and visuospatial functioning of the participants. One question scores one point with a total score of 9 points. If a participant could not catch 9 points, he or she would be excluded from the study.

Validity and Reliability

WHOQoL-BREF Questionnaire, Social-Support Questionnaire, and Charlson Comorbidity Index (CCI) were validated, translated, and previously used in Myanmar patients with T2DM. The researchers did not test their validity, but their reliability with 30 patients who had similar characteristics with the sample. The Cronbach's alpha value of the instruments was .90 for WHOQoL-BREF questionnaire, .87 for Social-Support Questionnaire, and .76 for Charlson Comorbidity Index (CCI).

Protection of Human Subjects

The current study was approved by the Institutional Review Board, Faculty of Nursing,Mahidol University, Bangkok, Thailand (COA No.IRB-NS2016/386.0912), the Ethical and Research Committee, University of Nursing, Yangon, and the Health Professional Resource Development and Management, Department of Medical Services, Ministry of Health and Sports, Nay-Pyi-Taw, Myanmar.

Data Collection

The first author collected the data at the Diabetes Clinic after obtaining permission from Yangon General Hospital. Staff nurses at the clinic screened the potential participants who met the inclusion criteria and introduced them to the researcher. Then, the researcher clarified the objectives, rights, risks and benefits to them. For the patients aged over 60 years, the researcher screened their cognitive ability by using the GPCOG questionnaire[23]. The researcher secured the written informed consent voluntarily from the potential participants who met the study criteria and willing to participate in the study and explained how to answer the questionnaires. The researcher also asked the permission from the participants to collect the data from their medical record.

Each participant spent approximately 25 to 30 minutes to complete the questionnaires. If the participants could not read or write or had visual impairment, the researcher interviewed them in a private room, and filled in the questionnaires as directed by the participants. After completing all processes of data collection, data were analyzed to answer the research question.

Data Analysis

All variables were analyzed by descriptive statistics including percentage, frequency distribution, mean, range, and standard deviation. Relationships among comorbidity, social support and HRQoL were investigated by using Pearson's product moment correlation coefficients (r). To examine relationships between gender, type of treatment, and HRQoL, two dummy variables were created with dummy codes (1 = female, 0 = male for gender and 1 = insulin, 0 = oral antidiabetic medications for type of treatment). Then, point biserial

correlation coefficients (r_{pb}) were calculated. Multiple regression analysis (enter method) was adopted to evaluate the predictive power of gender, type of treatment, comorbidity, and social support on HRQoL of the sample. Key assumptions of statistical analysis were tested and satisfactorily met.

Findings

The participants' mean age was 52.82 years (SD = 11.86). Seventy-four percent of them were female. Sixty-eight percent were married; and 59% lived with their spouse. The majority of the participants (87%) were Burma ethnicity; the others were Kayin (11%) and Kachin (2%). The mean years since diagnosed with T2DM was 5.21 (SD = 4.60). All the participants had taken oral antidiabetic medication; and only 15% of them had taken additional insulin injection. Averagely, the participants had mild comorbidity ($\overline{X}$ = 1.45, SD = 1.04). Hypertension was found to be the most common comorbidity (68%), followed by retinopathy (17%). The sample perceived overall social support at a moderate level, with a mean score of 19.31 (SD = 5.26). However, support from health personnel was reported at a poor level.

Moreover, as illustrated in table 1, the sample in this study reported their HRQoL at a moderate level ($\overline{X}$ = 77.92, SD = 11.40). According to the mean score of each domain, it was found at a moderate level in all domains including physical domain ($\overline{X}$ = 22.09, SD = 3.31), psychological domain ($\overline{X}$ = 17.06, SD = 3.44), social relationship domain ($\overline{X}$ = 9.25, SD = 2.03), and environmental domain ($\overline{X}$ = 23.64, SD = 3.78).

Table 1: Means, standard deviations, ranges and levels of HRQoL

Domain of HRQoL	Possible Range	Actual Range	$\overline{X}$	SD	Level
Overall HRQoL	26-130	46-104	77.92	11.40	Moderate
Physical domain	7-35	12-29	22.09	3.31	Moderate
Psychological domain	6-30	9-27	17.06	3.44	Moderate
Social relationship domain	3-15	13-13	9.25	2.03	Moderate
Environmental domain	8-40	34-34	23.64	3.78	Moderate

Regarding intercorrelations among the studied variables, social support was found to have a significantly positive correlation with HRQoL (r = .323, p < .01); and gender was found to have a significantly negative correlation with HRQOL (r_{pb} = -.266, p < .01) as shown in Table 2.

Table 2: Intercorrelations among gender, type of treatment, comorbidity, social support, and HRQoL

Variables	1	2	3	4	5
1. Gender	1				
2. Type of treatment	.057	1			
3. Comorbidity	.032	.083	1		
4. Social support	-.160	.034	.099	1	
5. HRQoL	-.266*	-.086	-.044	.323*	1

* p < .01

From the result of the multiple regression analysis, four independent variables jointly accounted for 16.2% of the variance in HRQoL (R^2 = .162, $F_{(4.95)}$ = 4.593, p < .001). However, social support (β = .298, p = .002) and female gender (β = -.211, p = .029) were the significant predictors of HRQoL in Myanmar patients with T2DM.

Table 3: Regression analysis of gender, type of treatment, comorbidity, and social support, predicting HRQoL

Variables	B	SEB	β	t	p-value
Constant	77.605	6.582		11.790	.000
Gender	-5.465	2.467	-.211	-2.215	.029
Type of treatment	-1.252	1.500	-.079	-.825	.406
Comorbidity	-.681	1.064	-.061	-.640	.524
Social support	.642	.206	.298	3.115	.002

$R = .403$, $R^2 = .162$, adj. $R^2 = .127$, df = 4,95, $F_{(4,95)} = 4.593$

Discussion

All 100 participants in the present study had a mean age of 52.82 years (SD = 11.86). Most of them (83%) were between the age of 41 to 73 years. This finding agreed with the results of the previous studies in that most of T2DM found in middle and old age group[7,17]. Because of medical advancement, life expectancy of persons with T2DM has been increasing over the past decades. In this study, the average number of years since diagnosis was 5.21 (SD = 4.60), with approximately 71% of the participants having experience living with T2DM between 2 to 9 years. However, the longest year reported by the participants was 23 years, indicating that patients with T2DM may experience living with T2DM longer.

This study found that Myanmar T2DM patients reported overall and four domains of HRQoL as moderate. This finding is consistent with that of other studies conducted in other countries such as India[5] and the United Arab Emirates[6]. However, the finding of this study was different from a study in Bangladeshi T2DM patients who reported their HRQoL as poor[7]. It is possible that this study demonstrated the better comorbidity in comparison with the poorer in the Bangladesh's study. It may be a reason why they reported poor HRQoL.

In multiple regression analysis, gender, type of treatment, comorbidity, and social support explained 16.2% of the variance in the HRQoL of Myanmar T2DM patients ($R^2 = .162$, $F_{(4,95)} = 4.593$, $p < .001$). Among the four variables, social support was the most important predictor of the HRQoL ($\beta = .298$, $p = .002$), followed by female gender ($\beta = -.211$, $p = .029$). The current study partially supported Zhan's QoL model[10], because social support, a variable in the category of socio-cultural-environmental factors, and gender, a variable in the category of personal background factors, significantly predicted the HRQoL. The other two variables, type of treatment and comorbidity which were in the category of health-related factors, were not predictor of HRQoL in the current study.

The sample in this study reported social support at a moderate level. Further, social support was found to be the strongest predictor of the HRQoL. This finding is supported by the studies from China[17] and France[18] in that the social support was a very powerful predictor of HRQoL in patients with T2DM. Persons with T2DM who perceived high social support are likely to have life satisfaction and high sense of well being. However, this finding is contrast with the findings from previous studies in Myanmar patients with T2DM[8-9]. Those studies found that patients with T2DM perceived high social support; and social support was not associated with the HRQoL. It should be noted that the participants in the two previous studies in Myanmar were recruited from private clinics. They had higher socioeconomic status than the sample in this study. Accordingly, they perceived high social support. These may explain, at least in part, why differences in results were found.

The personal background factor, gender, also contributed significantly to the HRQoL of

the sample (β = -.211, p = .029). More specifically, females with T2DM were more likely to perceive lower HRQoL. The finding is consistent with the previous studies from China[11] and South India[25] which indicated that females reported HRQoL significantly lower than males. Regarding this study results, the majority of participants (74%) were female; and most of them were housewives and dependent. As the norms of gender in Myanmar, females play major role in taking care of family members and serving family needs. When females are suffering from sickness or diseases, they feel shy and discomfort to ask for help. Thus, they could face more physical, emotional, and social distress when they have chronic diseases than males. In addition, in this study it was found that females had more diabetes related complications and more comorbidity than males. This might be the reasons why perception of HRQoL was different among male and female patients with T2DM; and gender was significant predictor of the HRQoL in this study.

Although hypothesized, type of treatment (β = -.079, p = .406) and comorbidity (β = -.061, p = .524), could not predict overall HRQoL in the present study. Homogenous sample could be an explanation. All participants received similar treatment which was oral antidiabetic medications. Of the sample, only 15 of them used insulin injection as additional treatment. The current result is consistent with the previous studies conducted in the private hospitals in Myanmar; they found that type of treatment was not associated with QoL in Myanmar patients wtih T2DM[8-9]. This finding was also supported with the previous study from Bangladesh, in which type of treatment was not predictor of HRQoL in patients with T2DM[7]. Additionally, comorbidity did not have predictive power on HRQoL in this study (β = -.061, p = .524). In contrast, the study of Wan, et al[11] and of Morales, et al[5] reported that comorbidity was a strongly predictor of HRQoL in their study. These contradiction results may have been caused by health conditions. HRQoL of the individuals deteriorates substantially with number of comorbidity. However, the sample in this study had quite good health condition. Averagely, the sample had mild comorbidity. Of all, no severe comorbidity was found. Therefore, it could explain why comorbidity could not predict HRQoL in this study.

Conclusion and Recommendations

Conclusively, social support (socio-cultural-environmental factor) and female gender (personal background factor) were the significant predictors of HRQoL in patients with T2DM in Myanmar. Based on the results of this study, implications are addressed as follows:

1. Myanmar nurses and health care personnel have a challenge in improving HRQoL of patients with T2DM. It is important to assess the patients' needs for informational and emotional support in order to provide them supportive services during clinic visits. Health counseling program and interventions should be established to enhance patients' perception of social support. It is also important to pay attention to services provided to women with T2DM to optimize their HRQoL.

2. Further studies should be conducted in a larger sample in other geographical locations in Myanmar, particularly in rural areas. Also, other predicting factors proposed in the QoL model not measured in this study should be included.

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