

# The Health-Related Quality of Life of Vietnamese Type 2 Diabetic Patients

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## ABSTRAK

*Diabetes jenis 2 adalah gangguan metabolik kronik yang menyebabkan komplikasi serius termasuk kualiti hidup. Penyelidikan ini menganalisis kualiti hidup yang berkaitan dengan kesihatan dan faktor relatif pesakit diabetes jenis 2 di Tam Binh District, Provinsi Vinh Long, Vietnam. Kajian keratan rentas telah dijalankan dari bulan Julai-Ogos 2019 di tujuh belas komuniti di daerah Tam Binh. Kesemua 500 pesakit yang menderitai diabetes jenis 2 dan berumur 35 tahun mengambil bahagian di dalam penyelidikan ini. Soal selidik penerokaan merangkumi Kualiti Hidup Diabetes Vietnam. Pesakit kencing manis mempunyai usia rata-rata  $59.77 \pm 9.81$  tahun. Skor kualiti hidup yang berkaitan dengan kesihatan adalah sederhana pada  $60.15 \pm 21$  mata. Perhubungan interpersonal mempunyai skor terendah, namun skor tertinggi dikesan untuk ketahanan fizikal. Perbezaan yang ketara dapat dibezakan pada komponen individu yang berbeza seperti usia, status perkahwinan, lokasi, jenis keluarga, pendidikan, pekerjaan, pendapatan, jangka masa, tahap glisemia, HbA1c, hipoglisemia, penggunaan alkohol, rawatan, dan masalah lain. Kajian menunjukkan bahawa diabetes jenis 2 mempunyai kesan negatif terhadap kualiti hidup yang berkaitan dengan kesihatan. Beberapa ciri pesakit telah mempengaruhi skor kualiti hidup diabetes Vietnam.*

*Kata kunci: diabetes mellitus, kualiti hidup, HRQoL, Vietnam*

## ABSTRACT

Type 2 diabetes is a chronic metabolic disorder that has serious complications including quality of life. This research analyses the health-related quality of life and the relative factors of type 2 diabetics in Tam Binh District, Vinh Long Province,

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Vietnam. A cross-sectional study was administered from July-August 2019 at seventeen communes in Tam Binh district. All total of 500 patients diagnosed type 2 diabetes and aged 35 years and older, comprised this investigation. The exploration questionnaire encompassed the Vietnamese Diabetes Quality of Life. Diabetics had an average age of  $59.77 \pm 9.81$  years. The health-related quality of life score was moderate at  $60.15 \pm 21$  points. The inter-personal relationship had the lowest score. However, the highest score was detected for the physical endurance. The significant differences could be distinguished at different individual components like age, marital status, location, family type, education, occupation, income, duration, glycaemia, HbA1c, hypoglycemia, alcohol-using, treatments, and other issues. The study highlighted that type 2 diabetes had a negative impact on health-related quality of life. Some patient characteristics affected Vietnamese diabetes quality of life score.

Keywords: diabetes mellitus, quality of life, HRQoL, Vietnamese

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## INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a persistent and thorough metabolic disorder, with a currently estimated global frequency of 8.3% (Papazafiropoulou et al. 2015; Alfian et al. 2016). In 2015, there were over 3.5 million Vietnamese adults who had acquired diabetes. T2DM was the most typical kind in Vietnam, with a prevalence that had doubled from 2.7% in 2002 to 5.4% in 2012 (Nguyen et al. 2018). The 2002 National Survey found that the percentage of people with diabetes between the ages of 30 and 60 nationwide was 2.7% (Quang et al. 2012).

The health-related quality of life (HRQoL) was described as the overall impact of a medical condition on a person's physical, spiritual and social aspects of health (Ibrahim et al. 2014; Rwegerera et al. 2017). Also, the HRQoL concept referred to the

discerned bodily and psychological well-being of an individual or group (Verma et al. 2010). It was a concern as an essential factor in managing population health status as well as in evaluating the burden of sickness and the efficacy of medical assistance (Mier et al. 2008). In dissociating the effect on health of chronic illness, HRQoL had also been applied as an outcome criterion because the patient collaboration created the basis of a medical programme for the disease (Lee et al. 2012).

T2DM can solemnly have an effect on HRQoL of patients (Vadstrup et al. 2011; Thomsen et al. 2014). The HRQoL was a significant outcome with T2DM people and had been used to assess the disease impact and its intervention on individuals and healthcare fees (Patel et al. 2013). Previous studies showed that T2DM was a factor which detrimentally impacted the HRQoL of T2DM patients (Company-Morales et

al. 2015). Most cross-sectional studies discovered that the diabetic person' HRQoL was inferior (Lu et al. 2017). This study analysed the HRQoL and the relative factors of type 2 diabetic patients in Tam Binh District, Vinh Long Province, Vietnam.

## MATERIALS AND METHODS

### Research Design

A cross-sectional study was administered from July to August 2019 at seventeen communities in Tam Binh District, Vinh Long Province, Vietnam. The area had about 160,000 residents. The participants included T2DM patients who had been diagnosed with T2DM for 6 months or more, were aged 35 years and older, had never been in a serious emergency and had never been hospitalised for one week or more. Pregnant women and those with disability or mental health problems were excluded. The sample size was calculated by the formula of descriptive cross-sectional study:  $n = Z^2 pq / e^2$ , where  $n$  was the minimum sample size prediction,  $Z$  was the standard deviation of 1.96 at 95% confidence interval,  $p$  was the estimated proportion of an attribute that was present in the population and  $q$  equaled  $1-p$ . In this research the value of  $p$  selected was 0.58, after research by Mathew et al. (2014). The  $e$  was the desired level of precision on  $p$ , which was about 0.05. Consequently,  $n = Z^2 pq / e^2 = 1.96^2 \times 0.58(1-0.58) / 0.05^2 \approx 374.33$ . With this result, we would select  $n=380$  diabetic people. However, we needed more than 30% sample size

to exclude those who did not agree to continue to participate in the study. Therefore, the minimum sample size of research was  $n = 380 + 30\% \times 380 = 494$  diabetic people. Finally, we collected the data on 500 participants.

### Survey Questionnaire

The study used the Vietnamese Diabetes Quality of Life (VNDQOL) questionnaire for the assessment of the assessment of the HRQoL of diabetic participants (Le et al. 2019). This instrument was the specific questionnaire which was designed and made the trial research on Tam Binh Health Center. This questionnaire had 68 questions which were in two parts: background information (27 questions) and quality of life (QoL) questions (41 questions). The HRQoL was evaluated using the nine domains of general health, activity limitation, physical endurance, diet and eating habits, symptom burden, financial aspects, emotional/mental health, inter-personal relationships.

### Statistical Analyses

The IBM SPSS statistical software version 22 was used to analyse the collected data. The descriptive statistics for sequence variables were means and standard error, while categorical variables were depicted as frequencies with percentages of the whole sample. The HRQoL questions on five abilities used the Likert 1-5 scale. Results were subsequently changed into percentage (per sum achievable score) with 100% denoting finest health and 0% worst

health. The formula of Jacobson & DCCT, 1994 was used for this conversion (Wang et al. 2008). Two-tailed p-value <0.05 was considered significant.

|  |                                       |       |
|--|---------------------------------------|-------|
| Transformed scale =                                    | Raw score - Lowest possible raw score | x 100 |
|  | Possible raw score range              |       |
| The formula of Jacobson & DCCT 1994 (Wang et al. 2008) |                                       |       |

### Study Ethics

This study inquiry had accomplished honesty and respected the volunteer’s privacy at all times. All investigators thoroughly honoured the ethical principles as required for such a biomedical study. This study had been submitted to and approved by the Mahasarakham University ethical committee and accepted by the Tam Binh District government. Written informed consent was obtained from all the participants.

## RESULTS

### Participant Characteristics

The participants were an average age of  $59.77 \pm 9.81$  years and range between 35 and 90 years. Women accounted for the majority of 77.4%. Table 1 showed that, regarding ethnicity, the Kinh dominated the survey with 98%, followed by the Khmer with 1.6% and only 2 Chinese (0.4%). Married patients accounted for 94% and 61% live in small families. The majority of the participants had primary or higher education, only 8% had no

education. There were 63.6% with jobs, 29.2% had retired and only 7.2% were unemployed. Figure 1 showed the distribution of patients across all 17 communes of Tam Binh district. It can be seen that Hoa Loc and Ngai Tu account for the highest numbers of patients, while Long Phu has the lowest number.

The duration of diabetes was as brief as 6 months and as long as 37 years. However, only 35.2% of people had received information relating to diabetes. The average glycemic level was  $9.84 \pm 4.03$  mmol/L, the lowest was 1.3 mmol/L and the highest was 33.3 mmol/L. The mean HbA1c was  $7.01 \pm 2.52\%$ , ranging from 2.8% to 15.1%. A total of 67% patients with type 2 diabetes were treated at public clinics or hospitals. Regarding the treatment of diabetes, the single use of oral medication accounted for the highest proportion with 47.6%, followed by no treatment which accounted for 34.6%, adjustment of the diet accounted for 13.2%, insulin injection accounted for 4%, combined insulin injection and oral medication accounted for 0.4%, and only 1 case 0.2% treated with traditional medicine.

A total of 56.8% patients had no signs of hypoglycemia in the past few months, 20.4% expressed 2-3 times/week, 16.8% had one time/week, especially 6% had the symptoms of daily hypoglycemia. A total of 88.4% people had other medical problems out of type 2 diabetes, including hypertension 56%, nerve problems 45.2%, high cholesterol 30.8%, visual problems 24%, renal problems 14.2%,

Table 1: The characteristics of study participants

| Characteristics                              | Participants (n=500)   |
|--|------------------------|
| Age (mean, SD, range (year))                 | 59.77 ± 9.81 (35 – 90) |
| Gender (n, %)                                |                        |
| Male   | 113 (22.6)             |
| Female                                       | 387 (77.4)             |
| Ethnicity (n, %)                             |                        |
| Kinh   | 490 (98)               |
| Khmer  | 8 (1.6)                |
| Others                                       | 2 (0.4)                |
| Marital status (n, %)                        |                        |
| Single                                       | 1 (0.2)                |
| Married                                      | 470 (94)               |
| Separated/Divorced                           | 1 (0.2)                |
| Widowed/Widower                              | 28 (5.6)               |
| Type of family (n, %)                        |                        |
| Small (1 - 2 generations)                    | 305 (61)               |
| Big (≥3 generations)                         | 195 (39)               |
| Income monthly (n, %)                        |                        |
| Low  | 50 (10)                |
| Medium                                       | 84 (16.8)              |
| High   | 366 (73.2)             |
| Diabetic management organisation (n, %)      |                        |
| Government clinic/hospital                   | 335 (67)               |
| Private clinic/hospital                      | 165 (33)               |
| Education level (n, %)                       |                        |
| Illiterate                                   | 40 (8)                 |
| Primary                                      | 173 (34.6)             |
| Secondary                                    | 179 (35.8)             |
| Tertiary and above                           | 108 (21.6)             |
| Diabetic duration (n, SD, range)             | 3.15 ± 4.84 (0.5 – 37) |
| Diabetes-related information (n, %)          | 176 (35.2)             |
| Other medical problems (n, %)                | 442 (88.4)             |
| Hypertension                                 | 280 (56)               |
| High cholesterol                             | 154 (30.8)             |
| Heart disease/heart block                    | 33 (6.6)               |
| Visual problems                              | 120 (24)               |
| Nerve problems                               | 226 (45.2)             |
| Problems with achieving/maintaining erection | 3 (0.6)                |
| Poor sexual desire                           | 27 (5.4)               |

| Characteristics                           | Participants (n=500)     |
|---|--------------------------|
| Renal problems                            | 71 (14.2)                |
| Treatment method                          |                          |
| Diet therapy only                         | 66 (13.2)                |
| Oral medications only                     | 238 (47.6)               |
| Insulin only                              | 20 (4)                   |
| Oral medications + insulin                | 2 (0.4)                  |
| Not on any treatment                      | 173 (34.6)               |
| Traditional medicine                      | 1 (0.2)                  |
| HbA1c (mean, SD, range (%))               | 7.01 ± 2.52 (2.8 – 15.1) |
| Glycemic level (mean, SD, range (mmol/L)) | 9.84 ± 4.03 (1.3 – 33.3) |
| Employment status (n, %)                  |                          |
| Working (full-time)                       | 231 (46.2)               |
| Working (part-time)                       | 87 (17.4)                |
| Unemployed/Not working                    | 36 (7.2)                 |
| Retired                                   | 146 (29.2)               |
| Hypoglycemia (n, %)                       |                          |
| Never once/few months                     | 284 (56.8)               |
| One/week                                  | 84 (16.8)                |
| 2-3 times/week                            | 102 (20.4)               |
| Daily                                     | 30 (6)                   |

heart disease/heart block 6.6%, poor sexual desire 5.4%, problems with achieved/maintaining erection 0.6%.

**HRQoL of Type 2 Diabetic Patients**

The HRQoL of type 2 diabetes in Tam Binh District was moderate  $60.15 \pm 21$  points. The inter-personal relationship

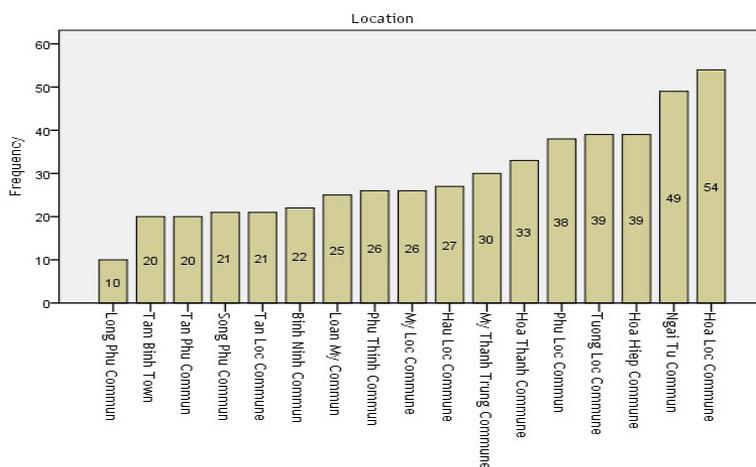


Figure 1: The number of participants is distributed in 17 communes, Tam Binh district

Table 2: Result of the health-related quality of life in the VNDQOL questionnaire

|                             | N     |         | Mean  | Median | SD    | Minimum | Maximum | Percentiles |       |
|-----------------------------|-------|---------|-------|--------|-------|---------|---------|-------------|-------|
|                             | Valid | Missing |       |        |       |         |         | 25          | 75    |
| General health              | 500   | 0       | 49.9  | 58.33  | 25.31 | 0       | 100     | 33.33       | 66.67 |
| Activity limitation         | 500   | 0       | 63.66 | 70.83  | 28.39 | 0       | 100     | 41.67       | 87.5  |
| Physical endurance          | 500   | 0       | 79.48 | 91.67  | 24.89 | 8.33    | 100     | 62.5        | 100   |
| Diet and eating habits      | 500   | 0       | 56.25 | 58.33  | 30.29 | 0       | 100     | 29.17       | 87.5  |
| Treatment                   | 500   | 0       | 48.96 | 50     | 19.61 | 0       | 100     | 37.5        | 62.5  |
| Symptom burden              | 500   | 0       | 70.27 | 75     | 21.41 | 8.33    | 100     | 58.33       | 91.67 |
| Financial aspects           | 500   | 0       | 76.98 | 80     | 24.41 | 0       | 100     | 65          | 100   |
| Emotional/ mental health    | 500   | 0       | 57.24 | 65     | 21.41 | 0       | 100     | 40          | 75    |
| Inter-personal relationship | 483   | 17      | 40.06 | 50     | 17.57 | 0       | 83.33   | 33.33       | 50    |
| Mean of VNDQOL              | 500   | 0       | 60.15 | 65.63  | 21    | 3.24    | 94.44   | 45.01       | 77.95 |

domain had the lowest score with an average of 40.06 as can be seen in Table 2. In analysis, the highest score was for the physical endurance domain with 79.48 points. Three fields had HRQoL score less than 50 points, namely "general health", "treatment", and "inter-personal relationship".

### Relationship between HRQoL and Personal Factors

As shown in Table 3, statistically significant differences were found in the following personal factors: age group, marital status, place of residence, type of family, educational attainment, occupational status, monthly income, duration of diabetes,

blood sugar, HbA1c, hypoglycemia, alcohol use, treatment methods and other medical issues.

The patients aged over 65 years had lower HRQoL scores than younger patients. Moreover, most components of HRQoL increased with the level of education. In addition, statistics showed that patients with a higher monthly income had better HRQoL scores (Table 4).

## DISCUSSION

T2DM was found to be a chronic metabolic disorder that definitely reduces a patient's HRQoL (Company-Morales et al. 2015). Our research demonstrated that VNDQOL was

Table 3: Relationship between HRQOL and the personal factors by One-Way ANOVA

|                    | F      | Significant |                        | F       | Significant |
|--------------------|--------|-------------|------------------------|---------|-------------|
| Age group          | 38.552 | 0.000       | Diabetic duration      | 17.383  | 0.000       |
| Gender             | 2.663  | 0.103       | Glycemic level         | 1.66    | 0.000       |
| Marital status     | 9.347  | 0.000       | HbA1c (%)              | 1.462   | 0.006       |
| Ethnicity          | 0.809  | 0.446       | Hypoglycemia           | 187.325 | 0.000       |
| Place of residence | 2.267  | 0.003       | Smoking                | 0.03    | 0.863       |
| Type of family     | 28.949 | 0.000       | Drinking               | 4.472   | 0.035       |
| Education level    | 2.735  | 0.043       | Treatment method       | 81.82   | 0.000       |
| Employment status  | 29.191 | 0.000       | Other medical problems | 61.555  | 0.000       |
| Income monthly     | 6.232  | 0.002       |                        |         |             |

an appropriate questionnaire for evaluating the HRQoL of Vietnamese patients with T2DM. The results showed that 500 patients participated in the study with an average age of  $59.77 \pm 9.81$  years. This average age was seen in a study of Javanbakht et al. (2012) ( $59.4 \pm 11.7$  years). In addition, several other studies showed that the average age of T2DM was lower such as Patel et al. (2014) ( $56.8 \pm 10.5$  years) or higher such as Sayah et al. (2016) ( $64.6 \pm 10.9$  years). However, this difference was not statistically significant and was appropriate for the age group of people with type 2 diabetes as Robert H. Eckel wrote in the literature (Powers 2013).

The quantitative findings of this research of 500 participants provided a better understanding of the implementation of the VNDQOL in Vietnam. Moreover, we observed that other medical issues such as hypertension, hyper-cholesterol, heart issues, optical disease, nerves problems, sexual libido, and kidney malady considerably impacted the HRQoL of these patients. The age group, education level, and

monthly income were also essential agents to the HRQoL of Vietnamese T2DM patients. First of all, there was significant difference in HRQoL between two age groups. The average score of the VNDQOL mark was lower in >65 age group compared to the 35-65 age group, which was pertinent to other studies examining the QoL among diabetic patients (Lu et al. 2017; Wang et al. 2008). Indeed, all elements of VNDQOL in the age group >65 were lower than the age group 35-65. This was because older people were often more worried and had more comorbidities (Nguyen et al. 2018).

Like other studies of Saku Väätäinen (Väätäinen et al. 2016) and Eldad Davidov (Davidov et al. 2009), women accounted for a higher proportion than men. In contrast, some studies reported that there was no gender difference in T2DM patients (de Luis et al. 2004), but others showed that the diabetic incidence of men was higher than women (Dawson et al. 2015). Differences in results between studies may be due to differences in customs, lifestyle, and diet. Indeed, this gender

Table 4: Relationship between the health-related quality of life and age group, education level, income monthly

|                         | Age group (year) |       |      | Education level |         |           |          | Income monthly |       |        |       |       |
|-------------------------|------------------|-------|------|-----------------|---------|-----------|----------|----------------|-------|--------|-------|-------|
|                         | 35-65            | >65   | Sig. | Illiterate      | Primary | Secondary | Tertiary | Sig.           | Low   | Medium | High  | Sig.  |
| General health          | 53.85            | 38.65 | 0.00 | 42.5            | 48.55   | 49.26     | 55.86    | 0.018          | 44.33 | 41.47  | 52.6  | 0.000 |
| Activity limitation     | 68.41            | 50.13 | 0.00 | 55.73           | 63.22   | 62.57     | 69.1     | 0.060          | 59.17 | 56.25  | 65.97 | 0.009 |
| Physical endurance      | 85               | 63.78 | 0.00 | 72.4            | 80.23   | 77.21     | 84.68    | 0.022          | 71.33 | 68.85  | 83.04 | 0.000 |
| Diet and eating habits  | 59.31            | 47.53 | 0.00 | 53.33           | 55.95   | 55.77     | 58.6     | 0.782          | 59.42 | 50.05  | 57.24 | 0.108 |
| Treatment               | 50.9             | 43.46 | 0.00 | 44.38           | 49.31   | 47.7      | 52.2     | 0.115          | 44.25 | 45.39  | 50.43 | 0.021 |
| Symptom burden          | 72.7             | 63.33 | 0.00 | 62.29           | 71.15   | 69.83     | 72.53    | 0.068          | 66.83 | 66.37  | 71.63 | 0.062 |
| Financial aspects       | 79.26            | 70.5  | 0.00 | 67.38           | 77.54   | 76.93     | 79.72    | 0.053          | 71.1  | 74.05  | 78.46 | 0.065 |
| Emotional/mental health | 59.86            | 49.77 | 0.00 | 50.38           | 57.95   | 56.12     | 60.51    | 0.062          | 52.9  | 53.33  | 58.73 | 0.036 |

difference was also observed in the Vietnamese population study by Nguyen et al. (2018). However, the HRQoL was similar in both genders. This result was similar to the studies of Nyanzi et al. (2014) and O'Shea et al. (2015), while differences in the study of Papadopoulos et al. (2007) were found.

The differences in QoL related to diabetes about the ethnicities in Naughton et al. (2008), Quah et al. (2011) and Zhang et al. (2012) did not show the statistical significance as our study. Similarly, differences in educational attainment did not indicate a significant change in HRQoL in T2DM patients. This was further confirmed by Turk et al. (2013), O'Shea

et al. (2015) and D'Souza et al. (2016). Although several studies have reported differences in quality of life at different levels of education such as Javanbakht et al. (2012) and Rwegerera et al. (2017). This was due to the propaganda of good knowledge about the disease in the community, but this has not been done best in the Vietnamese community, but only through health workers at health facilities. However, the workload of these employees was so great that this issue was taken lightly. It has been clearly shown in the research of Nhung Thi Ninh et al., and the author has proposed strengthening community education on type 2 diabetes (Thi & Dao 2013). This argument was also confirmed with the

result that patients received information about T2DM but the quality of life was lower than patients who did not know the disease information, this was because the patient had not received an exactly informative source. This has confirmed the weakness in education about diabetes prevention.

Additionally, patient's education had a negative effect on HRQoL. This result was consistent with previous studies of other authors (Wang et al. 2008; Rwegerera et al. 2019). This showed that people with higher education were better aware of diabetes so their quality of life was better. It was also clearly seen in the areas of "general health", "physical endurance" and "interpersonal relationship". Furthermore, the previous research found the QoL of diabetes decreased on the lower income group (Lu et al. 2017; Wang et al. 2008). A shortage of revenue leading to depression and insufficient health support might be another factor (Lu et al. 2017). Our research also showed similar results, that those with low incomes showed a statistically low quality of life. On the other hand, we also found a significant relationship in terms of HRQoL with other personal factors such as: marital status, location, type of family, working status, diabetic duration, glycemic level, HbA1c, hypoglycemia, drinking, treatment and other medical problems. These issues were also shown in the studies of Demirci et al. (2012), Lu et al. (2017) and Nguyen et al. (2018). Patients in different areas showed a difference in the HRQoL, the more it was confirmed with research by Wang et al. (2008). Similarly, the marital status and the type

of family large or small of the patient also greatly affected their HRQoL. This was made more explicit in the study of Pintaudi et al. (2015). However, the study by Papadopoulos et al. (2007) and O'Shea et al. (2015) did not show a significant difference between marital status and QoL. The research result of Nyanzi et al. (2014) was similar to our study with no statistical significance between the relationship of smoking and drinking with HRQoL.

## CONCLUSION

The study highlighted that type 2 diabetes had a negative impact on patients' health-related quality of life. Health-related quality of life was associated with age, level of education, marital status, location, type of family, employment status, income, duration, treatment, glycemic level, HbA1c, hypoglycemia, drinking, other medical problems. Increased age resulted in lower Vietnamese diabetes quality of life scores. This was the first report about health-related quality of life in Tam Binh district, Vinh Long province, Vietnam that used the specific questionnaire for Vietnamese. However, since our study was applied for cross-sectional study, further prospective studies are needed to confirm the results of particular study.

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