Depth of Knowledge on Diabetes and Adherence Level towards Medication among Type 2 Diabetic Parents of Udayana Medical Faculty Students Year 2020

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Abstract: **Diabetes mellitus is an ever growing medical condition. The aim of this research is to determine the depth of knowledge on diabetes and adherence level towards medication among type 2 diabetic parents of Udayana University Medical Faculty students. This descriptive research with cross sectional design was conducted using random sampling method. A total of 60 parents with diabetes were enrolled in this study. Male to female ratio was 1:1, with mean global Diabetes Knowledge Test score of 4,95±0,18. The majority of parents (75,00%) had average diabetes knowledge while 16,67% had low knowledge and 8,33% had high knowledge. Moreover, 70,00% of them had low adherence level towards medication while only 18 participants (30,00%) had average adherence. Parents' depth of knowledge regarding diabetes was found average in this study whereas adherence level was low. Better adherence and significant associations were found with longer duration of diabetes and the male gender. Healthcare providers should pay more attention to diabetes education, especially with respect to dietary concepts. Researchers and physicians in Indonesia should do similar research to get a more comprehensive picture of patients' knowledge of diabetes and adherence level towards medication.**

Keywords: **Type 2 diabetes, knowledge, medication, adherence.**

1. INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic diseases with characteristics of hyperglycemia that occurs due to abnormalities of insulin secretion, insulin work or both. DM diagnosis will generally be considered if there are typical complaints of DM in the form of polyuria, polydipsia, polyphagia, and weight loss that cannot be explained why. Epidemiologically, diabetes is often undetectable and it is said to be 7 years before the diagnosis is established, so early morbidity and mortality occur in undetectable cases.[16]

Patients with diabetes mellitus from year to year increase according to the International Diabetes Federation (IDF), the world population suffering from diabetes mellitus covers about 463 million people, and with the death rate of about 4.2 million people. WHO predicts people with diabetes mellitus will be about 366 million people in 2030. Contributors increased the rate was developing countries, which experienced an increase in diabetes mellitus 150% of countries with diabetes mellitus most are India (35.5 million people), China (23.8 million people), the United States (16 million people), Russia (9.7 million people), and Japan (6.7 million people).[9]

According to WHO 2016, people with diabetes mellitus in Indonesia is estimated to increase 8.4 million people in 2000, to 21.3 million in 2030. The high death rate makes Indonesia ranked fourth after the United States, India and China.

Based on the results of Household Health Survey, the prevalence of diabetes mellitus (DM) from 2001 was 7.5% to 10.4% in 2004, while the BPS survey in 2003 stated that the prevalence of diabetes mellitus reached 14.7 % in urban areas and 7.2% in rural areas.[17]

Diabetes mellitus if not managed properly will result in various chronic diseases, such as cerebrovascular disease, coronary heart disease, leg blood vessel disease, eye disease, kidney and nerves. If blood glucose levels can always be controlled properly, it is expected that all chronic diseases can be prevented, or at least inhibited. Various genetic, environmental and lifestyle factors play a role in the course of diabetes.[16]

The number of people with diabetes mellitus lately shows a significant increase worldwide. Lifestyle changes such as diet and reduced physical activity are considered the most important contributing factors. Therefore, DM may arise in people without a history of DM in the family where the process of disease occurs takes years and is largely asymptomatic. But DM can be prevented if we know the basics of the disease well and be wary of changes in our lifestyle.[10]

Many studies have been conducted to test patients' knowledge on type 2 diabetic. Generally patient's knowledge is yet to reach the optimal level. Factors such as education, family background and history, living areas and so on contribute to the depth of knowledge on diabetics. On the other hand, various studies have shown that adherence to the treatment of chronic diseases in both medical and nutritional terms is generally low. Based on studies, 75% of people with diabetes injects insulin in an inappropriate way, 58% takes the wrong dosage and 80% does not follow a diet that is recommended.[11]

In conclusion, diabetes mellitus is an ever growing medical condition. More researches should be conducted regarding this in order to produce a better generation in the future. Patient knowledge on DM needs to be monitored from time to time in order to ensure that they are updated with the current technology and development. On the other hand, patient's adherence in taking DM medicine need to be taken into account to make sure that they don't end up harming themselves by not following a proper diet, making lifestyle changes and so on. Therefore, in this study the researcher wants to determine the depth of knowledge on diabetes and adherence level towards medication among type 2 diabetic parents of Udayana medical faculty students.

2.   METHODOLOGY

This descriptive research with cross sectional design was conducted using random sampling method. A total of 60 parents with diabetes were enrolled in this study. The research was conducted for a period of 3 months from May to July 2020 through Google form. Subjects are included in this research if they are diabetic regardless of age and gender. Subjects are excluded if they did not fill up the questionnaires completely. Depth of knowledge was evaluated through Diabetes Knowledge Scale – True/False Version consisting of 10 statements developed by the Michigan Diabetes Research Training Centre (MDRC). Whereas, the 8-item Morisky Medication Adherence Scale (MMAS-8) was used to gather data on the adherence level towards medication among type 2 diabetic parents. The data was analysed based on the scoring system of respective questionnaires. Descriptive statistics includes mean, median, standard deviations, and range values for continuous data; percentage and frequency tables for categorical data. Multinomial logistic regression was used to analyze factors that were associated with diabetes knowledge and adherence to medications. Data gathered from the questionnaires is taken and analysed with a data processing program, namely Statistical Package for the Social Sciences (SPSS).

3.   RESULTS AND DISCUSSION

3.1 Social and Demographic Characteristics

In the present study, 60 parents with diabetes were enrolled. The male to female ratio was 1:1. The age distribution of Type 2 diabetes parents interviewed was evaluated. Majority (75,00%) of the patients were found to be between the ages of 41 and 65 years and only 11 of them (18,33%) were between 66 and 80 years old. It was also observed that no one was illiterate where 21,67% of the patients had primary education, 58,33% secondary education and 20,00% went to university or college. About 35,00% of the patients were newly diagnosed with diabetes 5 years ago or less (Table 1).

TABLE 1: Socio-demographic Characteristics of the Parents

Characteristics:	Frequency (n)	Percentage (%)
Age (years) and Sex		
20-40	4	6,67
41-65	45	75,00
66-80	11	18,33
Male	30	50,00
Female	30	50,00
Educational level		
Primary (SD)	13	21,67
Secondary (SMP/SMA)	35	58,33
University/ College	12	20,00
Years since diagnosis		
≤5	21	35.00
6-10	19	31.67
>11	20	33.33

3.2 Depth of Diabetes Knowledge

The majority of patients (75,00%) had average diabetes knowledge while 16,67% had low knowledge and only 8,33% had high knowledge according to the global Diabetes Knowledge Test scores with a mean 4,95±0,18. Figure 1 shows more details. Using an arbitrary cut-off point of 4-6 correct answers as an average knowledge level, 10 participants (16,67%) were below this level. About 5 participants (8,33%) scored 7 out of 10 which meant they were in the range of scores depicting high knowledge regarding diabetes. The highest score was 7 out of 10 while the lowest was 2 out 10. About 25 participants (41,67%) scored 6 out of 10 which was a major contributing factor in concluding parents' depth of knowledge as average (Figure 2).
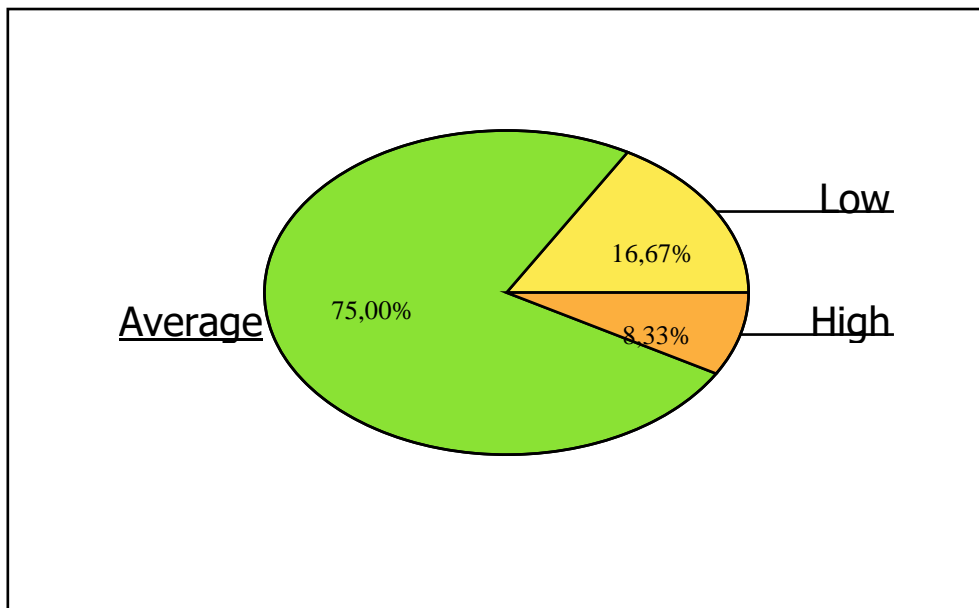

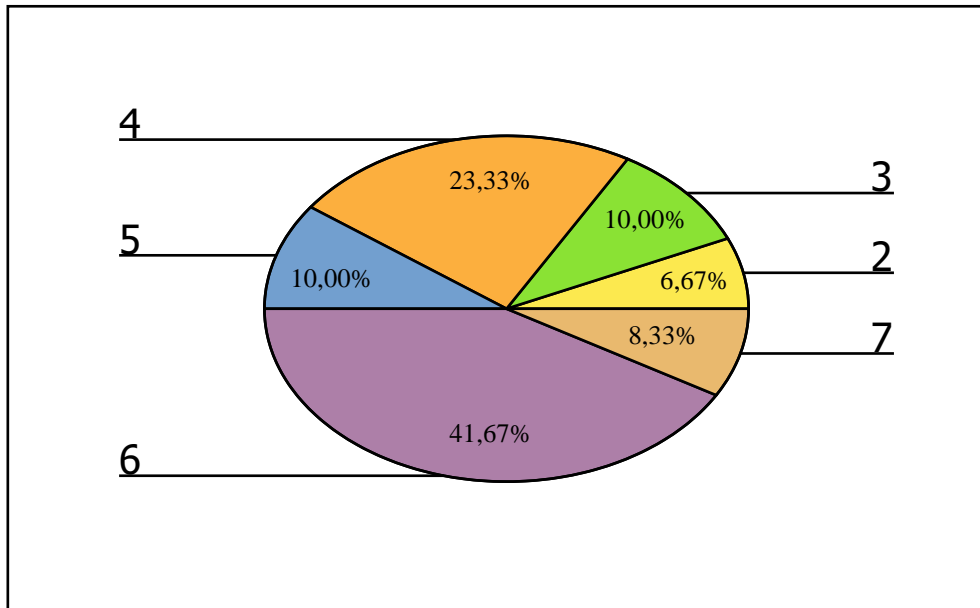
Fig. 1 Depth of parents' diabetes knowledge

Fig. 2 Diabetes Knowledge Test scores

3.3 Dietary Conceptions

This study found that patients had health misconception as noted from certain questions of the Diabetes Knowledge Test with average correct answer of 54,83%. Reassuringly, most participants were aware that the diabetic diet is a healthy diet, and knew about diabetes complications. Question 10 was the most incorrectly answered (63,33%) while question 2 was the most answered as 'Don't know' (43,33%) and question 9 was the most correctly answered (100,00%).

3.4 Diabetes Knowledge and Years since Diagnosis

The correlation analysis showed that diabetes knowledge score did not increase with the number of years since diagnosis (Figure 3). As might be expected, participants' age was correlated with years since diagnosis (R = 0.52, P < 0.0001).
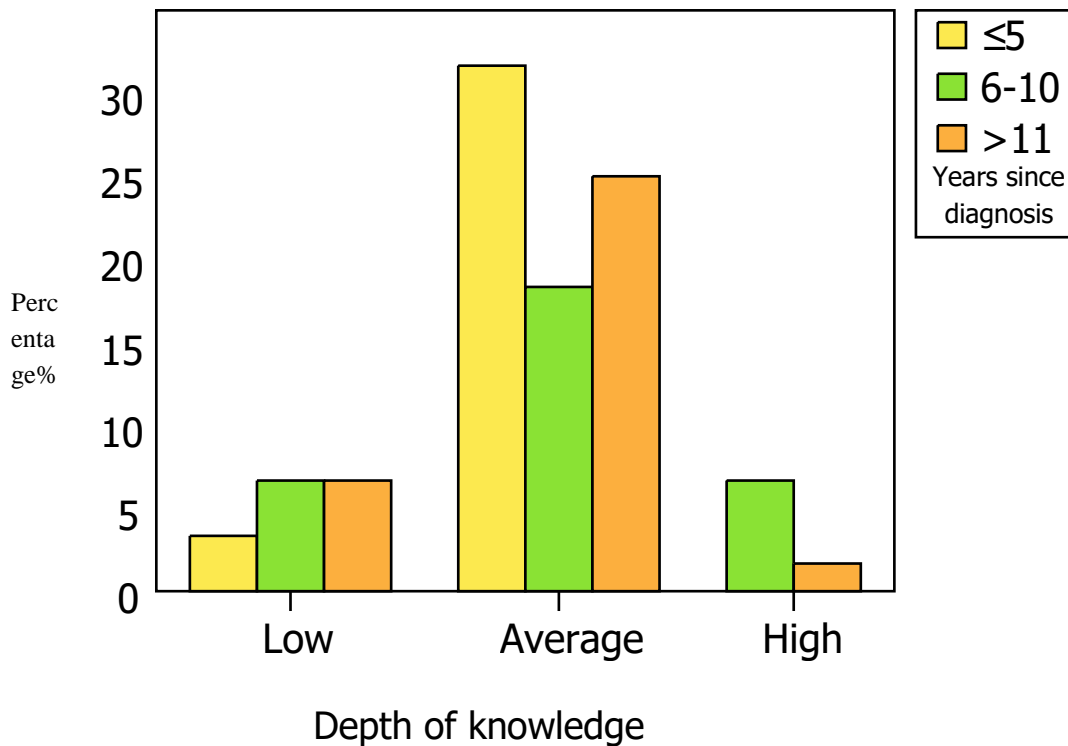

Fig. 3 Diabetes knowledge based on years since diagnosis

3.5 Adherence Level towards Medication

The majority of parents (70,00%) had low adherence level towards medication while only 18 participants (30,00%) had average adherence according to the Morisky Medication Adherence Scale scores with a mean 4,20±0,28. Figure 4 shows more details. The given cut-off point was scores more than 2 categorized as low adherence, scores 1 or 2 as medium adherence and score 0 as high adherence. No one had high adherence towards medication. There were 3 participants (5,00%) who scored 8 out of 8 depicting very low adherence.
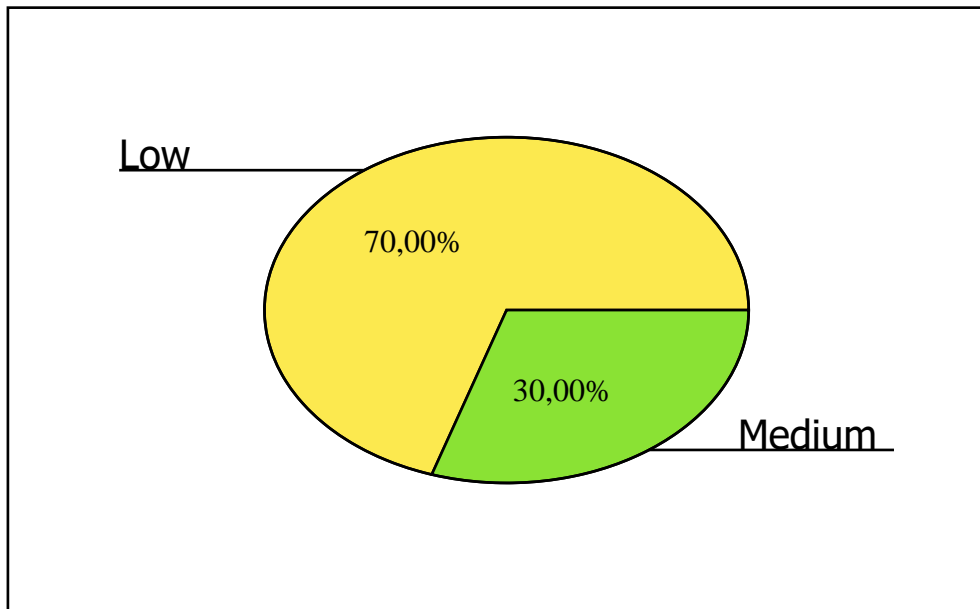

Fig. 4 Adherence level towards medication

Figure 5 and Figure 6 shows a significant P ≤ 0.05 association between gender, years since diagnosis and adherence. However, there is no significant P ≤ 0.05 association between age, educational level and adherence (Table 2 and Table 3).
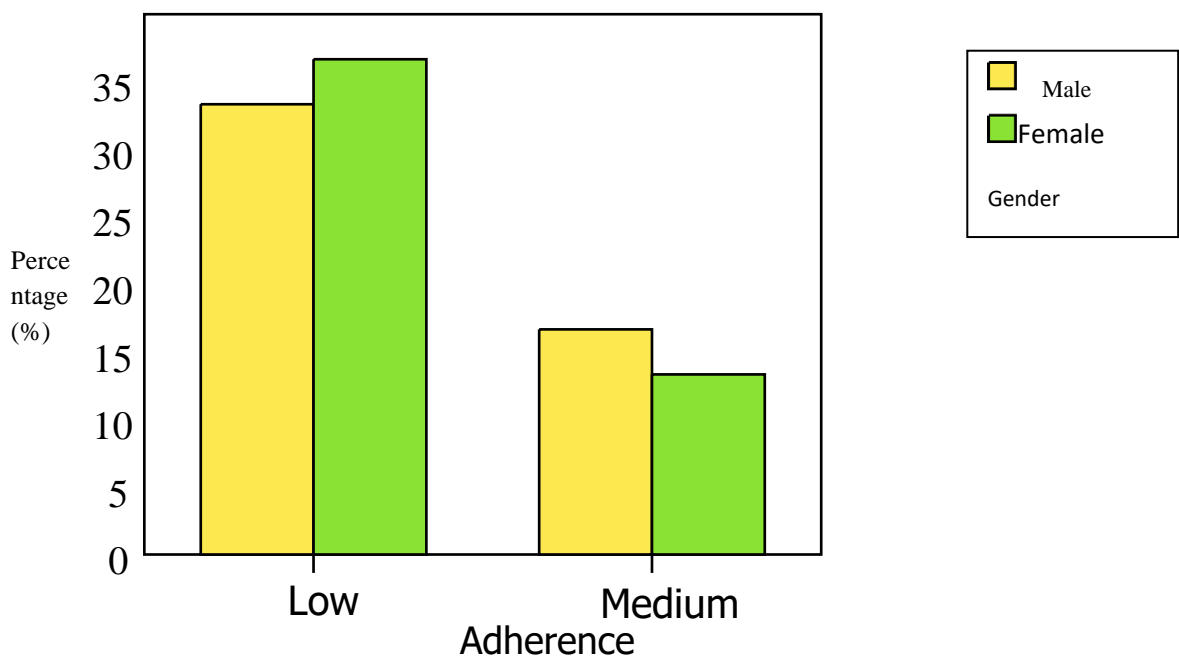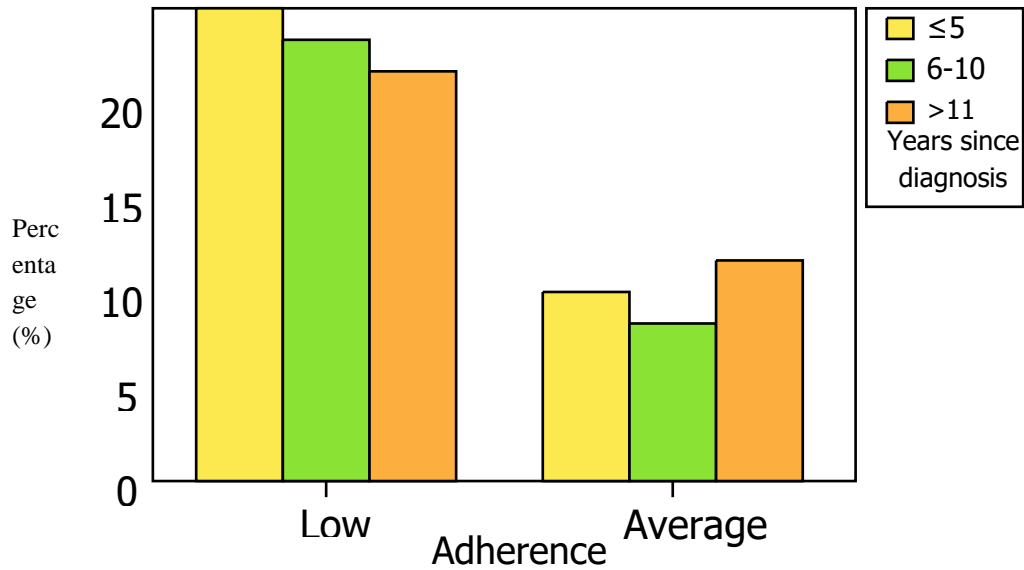

Fig. 5 Adherence level based on gender

Fig. 6 Adherence level based on years since diagnosis

TABLE 2: Association between participant's age and adherence

Adherence	Age			Total
	20-40	41-65	66-80	
Low	5.00%	55.00%	10.00%	70.00%
Medium	1.67%	20.00%	8.33%	30.00%
Total	6.67%	75.00%	18.33%	100.00%

TABLE 3: Association between participant's level of education and adherence

Adherence	Participant's level of education			Total
	Primary (SD)	Secondary school (SMP/SMA)	University/ College	
Low	15.00%	43.33%	11.67%	70.00%
Medium	6.67%	15.00%	8.33%	30.00%
Total	21.67%	58.33%	20.00%	100.00%

3.6 Parents' Adherence Level based on Depth of Knowledge

Based on the results there was no significant correlation between level of adherence towards medication and depth of knowledge on diabetes. Having higher depth of knowledge does not mean that parents adhere to their medication properly (Figure N).
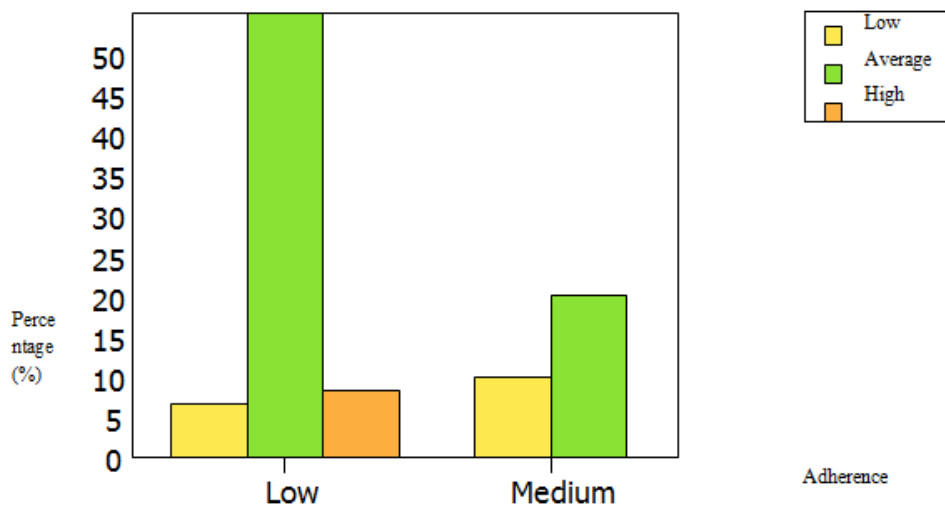

Fig. N Adherence level based on depth of knowledge

3.7 Discussion

Self-reported demographic data on participants were collected, including age, sex, educational attainment, and years since diagnosis of diabetes. For some patients, an attendant, usually a family member or a domestic aide, assisted in answering these questions. Bias was reduced in the data by using the same interviewer and questionnaire throughout the study. Quantitative data (continuous variables) were not grouped prior to statistical analysis. Almost all the MDKT questionnaire items had complete data. No adjustments were made to the analysis, as the sampling strategy yielded fairly representative data.

The result of the study presented impressive results with 83,33% of diabetic patients having average (75,00%) and high (8,33%) levels of diabetes knowledge. A comparison of the present study with previous studies that used Diabetes Knowledge Test and found almost similar results in Kuwait, Zimbabwe, Australia, Greece and USA studies, however results were different than Nigerian studies. Indian studies had a knowledge score of 45.0%±12.1% and Turkish studies had a knowledge score of 68.3%±16.1%, but they used different instruments to measure the knowledge.[5]

Misconceptions about diet are also common. These misconceptions may lead to persistent dietary patterns that jeopardize diabetes management, despite optimal drug treatment. On the other hand, knowledge of diabetes complications appeared satisfactory in the study participants, as found elsewhere. Some authors have speculated that knowledge alone is not sufficient to translate into the motivation needed for improved self-care. Diabetes education efforts should incorporate behavioural strategies to motivate and enable patients to care for themselves effectively.

Evaluating Morisky Medication Adherence Scale score, majority of parents (70,00%) had low adherence level towards medication while only 18 participants (30,00%) had average adherence. This is below satisfactory results. Previous study results shows that patients with higher depth of knowledge had higher adherence towards medication because they understood the importance of sticking to their treatment plan.

Since most of the parents scored average results in the knowledge test, similar result was expected for the adherence scale. But in this study, most parents had low adherence in taking their prescribed diabetes mellitus medicine. This is because most diabetic parents are not responsible when it comes to taking their medication properly.

Many tend to forget their schedule or do not take diabetic complications seriously. This behaviour needs to be changed in order to reduce the number of severe diabetes cases admitted in the hospitals. Skipping medication regularly will eventually lead to serious treatments such as surgery or amputation when things get out of control. Diabetes mellitus is not a disease but a mere medical condition. Therefore, precautionary steps are utmost important to maintain the blood glucose level. Patients should be monitored and reminded regularly to adhere to medication for their own wellbeing.

4. CONCLUSION

Based on the research done it can be concluded that the depth of knowledge of Udayana medical faculty students' parents on type 2 diabetes is average. Parents' adherence in taking prescribed diabetes mellitus medication was low. Hence, it is recommended that health care providers should pay more attention to diabetes education, especially with respect to dietary concepts. Researchers and physicians in Indonesia should do similar research to determine the level of diabetes knowledge in their fields, to get a more comprehensive picture of their patients' knowledge of diabetes. Non-adherence is a major factor that could lead to increased morbidity and mortality in diabetic patients. It is highly suggested that the next study should examine the reasons associated with the low frequency of high knowledge among diabetic patients. Strategies to be employed during intervention that will ensure improvement in adherence should be centred on patient related issues, medication related issues, prescriber related issues and pharmacist related factors.

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