

### Analysis of Factors Associated with the Incidence of Depression in Children with Diabetes

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#### ABSTRACT

Diabetes is a serious problem in both developed countries especially in developing countries. The impact of disease is not only on organ damage but also on psychological-social conditions. Children with diabetes can experience low self-esteem, feel isolated and discriminated against by their environment of which will lead to depression and even suicide (attempted suicide). The aim of the study is to identify the factors that contribute to the incidence of depression in children. Analytical research design with cross sectional approach. The sample consisted of 41 children with diabetes in West Java. the results of 23 respondents (56.1%) did not experience depression and 18 respondents experienced depression (43.9%). From the incidence of depression, 23 respondents (56%) had more female sex, 25 people (61%) of age 7-13 years (61%), 90% of primary education and the most duration of illness was in the range 1 - 5 years 53.7%. The results of statistical testing on the relationship between risk factors in this case gender, child's age, children's education, duration of illness and age at initial diagnosis of DM with the incidence of depression all factors have no significant relationship. For further research, it is hoped that the coverage area will be wider so that the samples are more and more representative.

**Keywords:** depression; gender; age of children; education; duration of illness

#### INTRODUCTION

Diabetes mellitus is a chronic disease that does not cause immediate death, but can be fatal if it is not properly managed. Management of DM requires multidisciplinary management that includes non-drug therapy and drug therapy. Diabetes mellitus occurs when blood sugar levels are too high. The body uses glucose for energy, fuel to carry out various body activities. The body will convert most of the food into glucose. Blood as a carrier of glucose will deliver it to cells throughout the body. Glucose requires insulin to enter the body cells. Insulin is a hormone produced in the pancreas. The pancreas releases insulin into the bloodstream and insulin will help glucose, from food enter the body's cells and open the cell doors so that blood sugar can enter them. If the body doesn't make enough insulin or the insulin doesn't work properly, glucose can't get into the cells, so it stays in the blood. This makes blood sugar levels high, and causes hyperglycemia. If not controlled, diabetes can lead to blindness, heart disease, stroke, kidney failure, and nerve damage. Diabetes in women can cause problems during pregnancy and make them more prone to give birth to babies with birth defects <sup>(1)</sup>.

The impact of disease is not only on organ damage but also on psychological-social conditions. People with JD can experience low self-esteem, feel isolated and discriminated against by their environment, all of which will lead to depression and even suicide <sup>(2)</sup>. The prevalence of psychiatric disorders that occur in diabetics is 21% anxiety, 7% withdrawal, 5.5% depression and 3.5% prolonged depression and 2% suicide risk. Of the total cases, 42.5% had more than one psychiatric disorder <sup>(3)</sup>. Children with diabetes have a twofold greater prevalence of depression, and up to three times more adolescents than adolescents without diabetes <sup>(4)</sup>. Depression in children and adolescents with diabetes is correlated with poor health conditions, blood glucose control and recurrence of ketoacidosis complications <sup>(4)</sup>. Psychological disorders make it difficult for people with diabetes to carry out the recommended treatment and activities <sup>(4)</sup>.

The prevalence of depression in adolescence showed an increase is very high compared to the age of childhood-childhood and adulthood <sup>(4)</sup>. Research conducted by Radloff and Rutter in adolescents-adolescents between races-the different races found that symptoms of depression increases from childhood-childhood to adolescence, and by signs of increased depression appear between the ages of 13-15 years, reaching a peak around the age of 17 - 18 years, and then become stable in adulthood <sup>(5)</sup>. Increased depression in early adolescence, many associated with gender. As noted by Silverstein and Lynch <sup>(6)</sup> gender differences in the symptomatology of depression have received a lot of attention, and current facts indicate that the prevalence of clinical and subclinical depression is higher among women.

The aim of the study is to identify the factors that contribute to the incidence of depression in children.

**METHODS**

The study design used an analytical approach cross sectional. The study population was children with juvenile diabetes in West Java. The research sample consisted of 41 children with juvenile diabetes with inclusion criteria aged 6 to 18 years and went to RSHS, RSUD Dr. Soekardjo Tasikmalaya, Ciamis Regional Hospital, Gunung Jati Cirebon Regional Hospital and RSUD 45 Kuningan. The instrument used to assess depression in children used the Children Depression Inventory (CDI) questionnaire. This questionnaire has been widely used in research and has been tested for validity and reliability with the results of one of the nine studies obtained Internal consistency using Alpha Cronbach 0.71-0.89; whereas in another study, the retest test was performed 16 times, the results were 0.38-0.87. In correlating CDI and CDI factors with the same psychological assessment for children and / or adolescents, studies have shown moderate to high correlations, construct validity and discriminant validity have been established. The CDI questionnaire consists of 27 questions regarding cognitive, affective and behavioral aspects for children aged 7 to 17 years.

**RESULTS**

The results showed 23 respondents (56.1%) did not experience depression and 18 respondents (44.9%) experienced depression. From table 1, it can be seen that 23 people (56%) of respondents have female gender, 25 people are in the range of 7-13 years of age (61 %), basic education at most 90% and the most duration of illness in the range of 1 - 5 years 53.7%.

Table 1. Distribution of respondents based on the incidence of depression

Variable	Frequency	Percentage
Depression	18	44.9
Not depression	23	56.1

Table 2. Distribution of respondents based on children's age, level of education and duration of illness

Variable	Frequency	Percentage
Age		
•7-13	25	61
•14-18	16	39
Level education		
•Elementary school	37	90.2
•Junior high school	4	9.8
Duration of illness		
•<1 year	22	53.7
•1-5 years	11	26.8
•>5 years	8	19.5

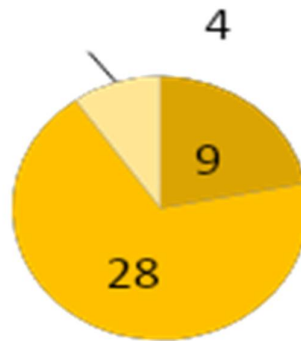


Figure 1. Age of children when diagnosed with diabetes

Figure 1 shows that out of 41 respondents 28 people (68.3%) were diagnosed with diabetes at the age of 7-13 years, 9 people (21.95%) at the age of 14-18 years and 4 people (19.04%) at the age less than 6 years.

Table 3. Relationship between sex, age of children, education of children and duration of illness to depression incidence

Variable	Incidence of depression in children				p-value	OR	95% CI
	No depression		Depression				
	Σ	%	Σ	%			
1. Gender							
a. male	8	34.7%	8	44.4%	0.748	0.667	0.188 - 2.362
b. Female	15	65.2%	10	55.6%			
2. Age of children							
a. 7 - 13 years	16	69.6%	9	50%	0.334	2.286	0.634 - 8.234
b. 14 - 18 years	7	30.4%	9	50%			
3. Education							
a. Basic	22	95.7%	15	83.3%	0.303	4,400	0.417 – 46.433
b. Intermediate	1	4.3 %	3	16.7%			
4. Duration of DM							
a. <1 year	7	30.5%	4	22.2%	0.698		
b. 1 - 5 years	11	47.8%	11	61.1%			
c. > 5 years	5	21.7%	3	16.7%			
5. Age at diagnosis of diabetes							
a. <6 years	5	21.7%	4	22.2%	0.404		
b. 7 - 13 years	17	73.9%	11	61.1%			
c. 14 - 18 years	1	0.04%	3	16.7%			

Judging from the table above, all variables do not show a significant relationship either variable gender, age of the child, children's education, length of time the child suffered from diabetes and age at initial diagnosis of DM on the incidence of depression in children so that all variables do not allow it to be continued in the multivariate analysis.

## DISCUSSION

### Relationship between Sex and Depression

Depression is a state of heartbreak or hopelessness accompanied by a weakening of sensitivity to certain stimuli, a reduction in physical and mental activity and difficulty in thinking <sup>(7)</sup>. The American Psychological Association (APA) <sup>(8)</sup> defines depression as feeling sad or empty accompanied by decreased interest in pleasant activities, sleep and eating disorders, decreased concentration ability, excessive guilt, and thoughts about death or suicide <sup>(7)</sup>. Many studies show that twice as many women experience depression as men (Nolen-Hoeksema in Davison et al., 2006 in <sup>(7)</sup>). In fact, a number of studies have found women are three times more prone to depression than men. This applies to both mild, moderate, and severe depression. This gender difference is found in a number of countries, ethnic groups, and all stages of adulthood. Interestingly, Lubis (2009) in <sup>(7)</sup> stated that before adolescence, there was only a slight difference in the level of depression between boys and girls, but between 11 and 13 years of age there was an increased tendency for depression in women. At the age of 15, women are twice as likely as men to develop depression. The sources of stress for boys and girls are generally the same, but the impact of this burden is different for girls and boys. Young girls are more sensitive to their environment. Amir (2005) <sup>(7)</sup> adds that depression is more common in women, because it is related to hormonal imbalances in women, for example, the presence of premenstrual, depression postpartum and postmenopausal. Brizendine (2007) states that there are different responses to conflict between men and women <sup>(7)</sup>. The female brain has a negative awareness of conflict and stress, in women conflict triggers negative hormones, causing stress, anxiety and fear. Men often enjoy conflict and competition, and they even think that conflict provides a positive impetus. It can be concluded that when women face conflict, they are often more sensitive to psychological responses, while men are more sensitive to physiological responses, so that when women are under pressure, they are generally easier to experience stress which can then lead to depression. Based on the results of the study, the incidence of depression in children with diabetes was more common in girls, 55.6% compared to boys = 44.4%. However, from the results of statistical testing, it was found that p value= 0.748 or a p value of more than 0.05, which means that there is no significant relationship between

gender and the incidence of depression. OR = 0.667, meaning that men have a tendency of 0.667 times not to be depressed compared to women.

### **Relationship between Children's Age and the Incidence of Depression**

Based on the results of research that has been done, the proportion of depression experienced in children aged 7-13 years and 14-18 years is 9 out of 18 respondents who experience depression. When viewed from the growth and development of children, children aged 7-13 years are included in the category of school-age children where at that time the children are already sensitive to their bodies, especially girls<sup>(9)</sup>. Moreover, at the age of 14-18 years, which is included in the category of adolescents to adolescent. In general, the prevalence of depression in adolescence showed an increase is very high compared to the age of childhood-childhood and adulthood. Research conducted by Radloff and Rutter in adolescents-adolescents between races-the different races found that symptoms of depression increases from childhood-childhood to adolescence, and by signs of increased depression appear between the ages of 13-15 years, reaching a peak around the age of 17 - 18 years, and then become stable in adulthood<sup>(9)</sup>. From the statistical test results obtained p value= 0.334, which means that there is no significant relationship between children's age and the incidence of depression. The results also showed that the OR was 2.286, which means that children aged 14-18 years were 2.286 times more likely to develop depression than children aged 7-13 years. This is in accordance with previous studies where depression was more prevalent in adolescents<sup>(6)</sup>.

### **Relationship between Education and the Incidence of Depression**

Referring to the results of the research conducted, it turns out that The incidence of depression was more common in children with basic education, which was 83.3%. Although the results of statistical testing show that p value= 0.303, which means there is no significant relationship between children's education and the incidence of depression. This is different from previous studies where depression is more common in adolescents<sup>(6)</sup>. But even so the growth and development factors in children really support the results of this data. Children with basic education levels are in the age range of 7-13 years, at which time the child is experiencing puberty and hormonal instability. Hormonal changes that result in changes in the body make it easy for children to feel depressed, especially girls<sup>(9)</sup>. In addition, anxiety can also be caused by ignorance of the diseases they are experiencing and their self-care as juvenile diabetes sufferers. Diabetes care mainly consists of self-care. Diabetic patients themselves must regulate their blood glucose levels by monitoring their blood glucose levels and by balancing their food intake, physical activity and their intake of oral hypoglycemic agents and / or insulin<sup>(4)</sup>.

### **Relationship between Duration of Illness and the Incidence of Depression**

The results of data analysis on the relationship between depression and duration of illness did not show a significant relationship with p value= 0.698. It is different from previous studies, that there are several physical diseases that can be comorbid with depression<sup>(4)</sup>, such as diabetes. In children with juvenile diabetes requires patient compliance in undergoing treatment that is long and up to a lifetime. Decreasing quality of life for a person due to chronic disease limits daily activities, which can exacerbate psychological conditions into depressive conditions<sup>(10)</sup>.

### **The Relationship between the Age at the Onset of DM with the Incidence of Depression**

The results of the data analysis on the relationship between depression and the initial age at diagnosis of DM also did not show a significant relationship with p value= 0.404. However, there is evidence that the incidence of depression occurs more frequently when the child is diagnosed with DM at the age range of 7-13 years, at which time the child is experiencing puberty and hormonal instability, which makes it more likely that the child is easily depressed<sup>(9)</sup>.

### **CONCLUSION**

Incidence of depression in 41 respondents showed that 23 respondents (56.1%) did not experience depression and 18 respondents experienced depression (43.9%). From the incidence of depression, 23 respondents (56%) had more female sex, 25 people (61%) of age 7-13 years (61%), 90% of primary education and the most duration of illness was in the range 1 - 5 years 53.7%.

The results of statistical testing on the relationship between risk factors in this case gender, child's age, children's education, duration of illness and age at initial diagnosis of DM with the incidence of depression all

factors have no significant relationship. For further research, it is hoped that the coverage area will be wider so that the samples are more and more representative.

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