

## Screening of depression in early onset of type 2 diabetes mellitus patients

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**Abstract**

**Introduction:** Depression and diabetes happen to be very related since the occurrence of one leads to the occurrence of the other.

**Materials and Methods:** This research used 60 human subjects who have been diagnosed to have the early onset of type 2 diabetes mellitus patients. Among the many depression screening tools, the Beck Depression (BDI) Inventory was used to get the levels of depression among the patients.

**Results:** Having used three grouping of age, gender, and race, the following percentage ratios were obtained. Millennials: Generation X: Baby Boomers = 63:42:13. Male: Female= 51:49. American Indian: African American: Asian: Native Hawaiian: White = 2:27:3:3:65.

**Discussion:** Young people showed extreme levels of depression respectively. Gender seemed to be a balance but the males are more likely to be at a higher risk.

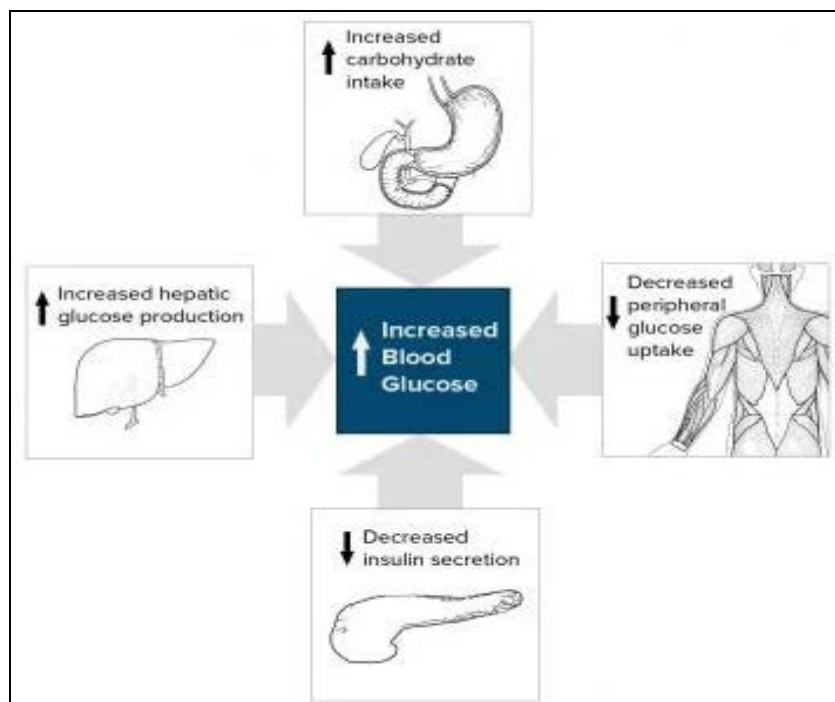
**Conclusion:** People need to watch out for the lifestyles of their children as well as the kind of lifestyles of the male gender to reduce cases of type 2 diabetes mellitus, which leads to high levels of depression.

**Keywords:** type 2 diabetes mellitus; depression; beck depression Inventory (BDI)

**Introduction**

Type 2 diabetes mellitus is a group of abnormal functioning of body organs whereby there is hyperglycemia, abnormality of insulin action, secretion of inadequate insulin, and secretion of glucagon that is excessive or inappropriate. In other words,

there is an increased intake of carbohydrates and decreased insulin secretion. There is also the aspect of the increased production of hepatic glucose but there is a decrease in the peripheral glucose uptake in the body. The image below displays a summary of the just explained concept.



**Fig 1:** Pathophysiology of type 2 diabetes mellitus.

This type of diabetes is the most common and can be caused by factors such as being overweight, eating foods with a lot of

sugar and carbohydrates, genetics, lack of exercise and stress. In most cases, there are no symptoms of type 2 diabetes mellitus but aspects like blurred vision, frequent urination, increased hunger, slow healing of wounds, dark skin patches, extreme thirst, numbness or nerve pain, and yeast infections could be seen when the complication is found out. Screening of depression, on the other hand, is a procedure prioritized for patients with diabetes and coronary heart disease because it is more common to people with chronic diseases than with those in good health. However, other conditions could call for screening of depression such as drug abuse, old age, and stressful environments at home among others. Colin further goes ahead and reports that by 2020, depression is expected to be in the second place when it comes to Disability Adjusted Life Years (DALYs) for people of all ages.” DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences”. The equation below presents a formula for getting the disability of early life years as well as the breakdown of the same.

<b>DALY = YLL + YLD</b>
Below is the breakdown of the above formula
$YLL = N * L$
where:
N = number of deaths
L = standard life expectancy at age of death in years
$YLD = I \times DW \times L$
where:
I = number of incident cases
DW = disability weight
L = average duration of the case until remission or death (years)

**Fig 1:** Disability-Adjusted Life Year (DALY) Calculation

There has been a lot of research showing the relationship between type 2 diabetes mellitus and depression and urging of people with type 2 diabetes mellitus and depression on the importance of screening for depression. The reason behind the research is to get how the two relate and find ways of solving or rather addressing the diseases. This research article, therefore, studies the screening of depression in early type 2 diabetes mellitus patients at K.V.G Medical College hospital. It then presents the findings of what category of type 2 diabetes mellitus patients have higher levels of depression than others

**Material and Methods**

The subjects of the study are human beings; patients who have been recently recognized with the type 2 diabetes mellitus condition. The hospital holds 236 patients, however, those

with the early onset of type 2 diabetes mellitus are 73 (31%) in number. 13 (18%) of them did not agree to take part in the study leaving the research with 60 (82%) patients to work with. From the 60, all the patients were over 18 years of age. The other people used in the research are nurses who aided in handling the whole procedure.

**Study Procedure**

Official procedures were followed before conducting the research like asking for approval from the ethical medical committees and seeking permission from the hospital to use the patients as well as other resources like the nurses and some medical health records. Before any patient was interviewed, he or she had to sign a consent form to officiated the agreement of taking part in the study. Working with 8 patients per day, the whole interview process at the hospital took 8 working days. It then took another 5 working days to compile the findings and come up with documented results, discussions and conclusion. Therefore the whole study process began on 23<sup>rd</sup> May 2018 and ended on 8<sup>th</sup> June 2018; 13working days in total.

The system used is the Beck Depression Inventory (BDI); a validated system with very specificity and sensitivity in detecting depression for people at the age of thirteen and above. The system has 21 items for self-report rating where symptoms of depression, as well as characteristic attitudes, are measured. It has four points on the scale ranging from 0 (no symptom present) to 3 (very intense symptom). To get the results, one sums up all the scores; the highest score that can be achieved are 63 having chosen 3 on all while the lowest score that can be achieved is 0 having chosen 0 on all. Evaluation is then done using the table shown below.

**Table 1:** Levels of Depression

Total Score	Levels of Depression
1-10	These ups and downs are considered normal
11-16	Mild mood disturbance
17-20	Borderline clinical depression
21-30	Moderate depression
31-40	Severe depression
Over 40	Extreme depression

The whole process takes around ten minutes. Data on age and gender were also collected.

**Results**

The following results were obtained depending on the different groups of data namely age and gender. Interestingly enough, all these group samples we equally or almost equally represented making it very easy to present the results.

**Age**

The millennials gave an average BDI score of 40 (63%). Generation X, on the other hand, gave an average BDI score of 15 (24%). Lastly, the baby boomers gave an average BDI score of 8 (13%).

**Gender**

When the patients were grouped according to gender, the

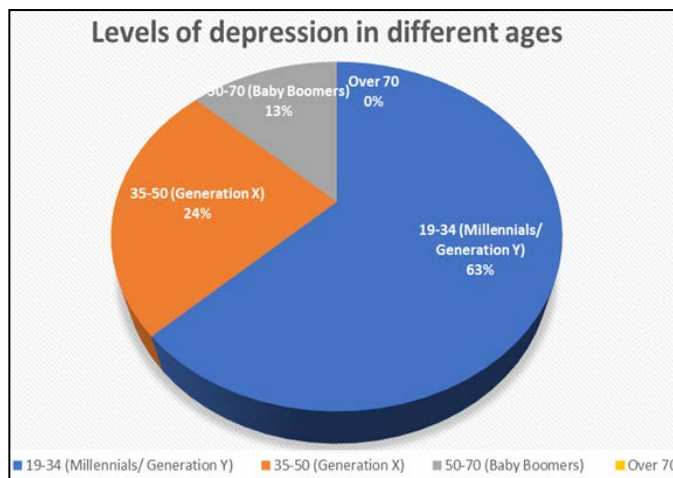
males have an average BDI score of 32 (51%) while the females gave an average BDI score of 31 (49%).

The table below gives a summary of all the results for easier interpretation.

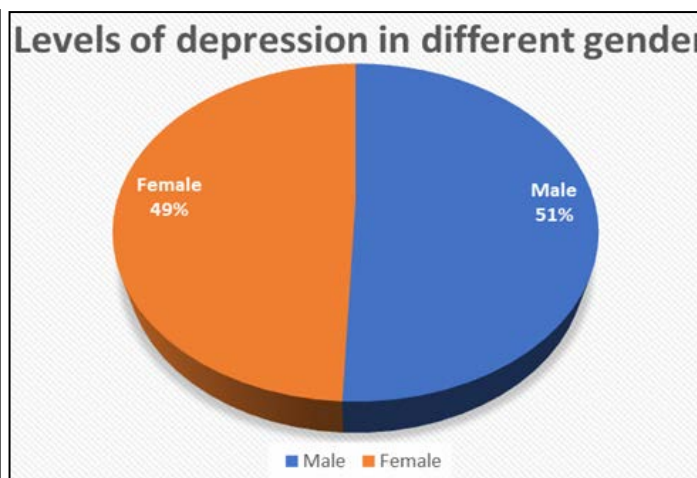
**Table 2:** Beck Depression Inventory (BDI) Scores

Classification	Beck Depression Inventory (BDI) Average ScoresN=63	Percentage Scores (%)
<b>Age (Years)</b>		
19-34 (Millennials/ Generation Y)	40	63
35-50 (Generation X)	15	24
50-70 (Baby Boomers)	8	13
Over 70	0	0
<b>Gender</b>		
Male	32	51
Female	31	49

The figures below show a more graphical analysis of the results.



**Fig 2:** Levels of Depression – Age

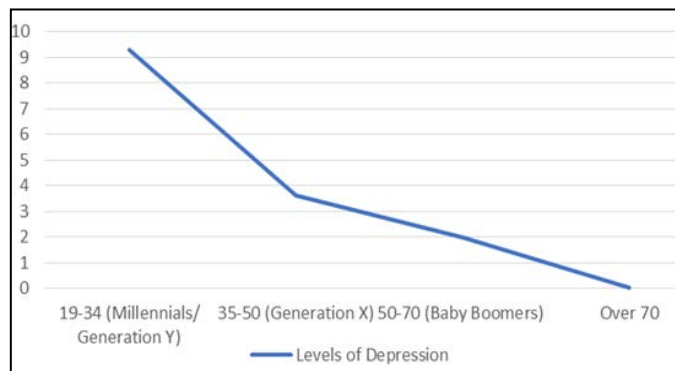


**Fig 3:** Levels of depression: Gender

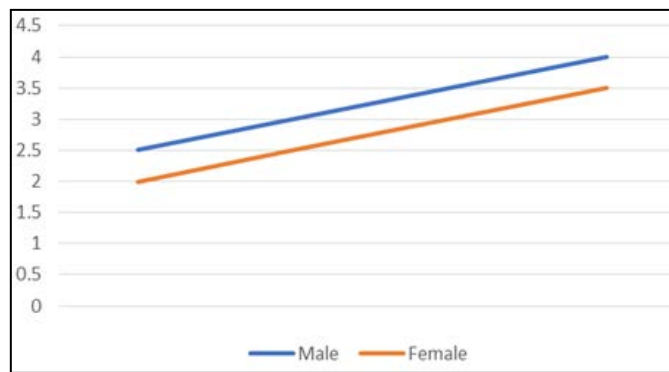
**Discussion**

From the results, the millennials, or rather the patients from the age of 19 to 34 years happened to show high levels of depression. These are extreme levels of depression according to the reference table with an analysis of the levels of depression. The levels then reduced as the ages went up. The graph below presents a graphical presentation showing increasing levels of depression depending on decreasing age.

When it comes to gender, the males happen to have slightly higher levels of depression as compared to females. Since the percentage difference is only one unit, it could be said that with gender all people are at risk of getting depressed but it seems that men might be at more risk. The graph below presents how levels of depression of males are slightly higher than those of females.



**Fig 4:** Levels of Depression depending on age



**Fig 5:** Levels of depression depending on gender

This age group with extreme depression is of very young people, an indication that most people getting depressed in the early onset of type 2 diabetes mellitus are the young people.

**Conclusion**

Parents should watch out for the lifestyle of the young people, as these are the most people getting depressed as well as being at a higher risk of getting the type 2 diabetes mellitus.

Previously higher levels of depression were seen in the old people but things seem to have changed. The male gender should also watch out for their lifestyle as statistics show they are more likely than women, to get depression because of type 2 diabetes mellitus.

### **Acknowledgments**

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