

Original Article



# Generalized Anxiety Disorder (GAD) in Intelligent Students in Relation to Temperament, Family, and School

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**Citation** M. Nouri, **Generalized Anxiety Disorder (GAD) in Intelligent Students in Relation to Temperament, Family, and School.** *Int. J. Adv. Stu. Hum. Soc. Sci.* 2024, 13 (4):294-303.

 <https://doi.org/10.48309/IJASHSS.2024.449307.1189>



## Article info:

**Submitted:** 2024-03-19

**Revised:** 2024-04-04

**Accepted:** 2024-05-02

**ID:** IJASHSS-2403-1189

**Checked for Plagiarism:** Yes

**Language Editor Checked:** Yes

## Keywords:

Generalized anxiety disorder (GAD), Intelligence student, Temperament, Classroom anxiety measure (CAM).

## ABSTRACT

The relationship between intelligence and generalized anxiety disorder (GAD) has been investigated by a large number of researchers in adolescent students. It has been proven a positive correlation between intelligence and GAD. However, there are several reports based on negative correlation between intelligence and GAD. This is due to the presence of other influential factors. These factors include genetic factors, social and environmental agents, family conditions, individual characteristics, and temperament of the students. It seems that less attention has been paid to the effects of student temperament on the intelligence and GAD. In this study, 40 intelligent students in gifted school have been examined for GAD by classroom anxiety measure (CAM) test and its relationship with temperament. During six months, these students were evaluated from the aspect of the educational performance, mental and psychological conditions, temperament, and personal and family problems. The results were remarkable and showed a meaningful relationship between some temperaments such as melancholic and sanguine temperament with the GAD occurrence in adolescent students. Likewise, this study showed that intelligent students with choleric temperament are less prone to GAD. It was further found that there is a significant relationship between three elements of intelligence, hot temperament (both melancholic and sanguine), and GAD.

## Introduction

Studies have shown that a high degree of worry in students with generalized anxiety disorder (GAD) may be positively correlated with intelligence. Likewise, in some students, the low level of worry would have a positive correlation

with intelligence [1,2]. In an assessment, some people were assessed using the Penn State Worry Questionnaire (PSWQ) [3], and patients with GAD were selected. The GAD patients were evaluated by Wechsler short intelligence quotient (IQ) and selected based on their high intelligence compared to control group. The result revealed that relatively high anxiety in

GAD patients can be a reason for high IQ, but there was evidence that control group with high intelligence may have relatively low anxiety [1].

In another study, it has been determined the positive relationship between GAD and intelligence in patients, but negative relationship in control [4]. However, the effects of other factors have not been fully investigated on the positive or negative relationship between high IQ and GAD [1-4]. The important influencing factors in the GAD occurrence are temperament characteristics [5], family history [6], and other unknown factors. The presence of any disorder in temperament or family history causes cognitive challenges [4-6]. The high level of intelligence may lead to an increase in cognitive challenges. Insufficient recognition and lack of skill in facing the cognitive challenge can aggravate the GAD. [1]. Attention to the GAD in intelligent students is very important because it seems that this disorder is very common among them [4-6].

### *Intelligence Quotient (IQ)*

Although different definitions for IQ have been presented, the common denominator of all of them is how much a person is skilled in dealing with her/his own emotions and those of others. In addition, guiding and managing cognitive challenge is effective in determining the IQ level. But definitely, social interaction leads to an increase in understanding of surrounding issues and creates the ability to solve complex challenges [7]. However, there is still no general agreement on the precise definition of IQ and its classification because of the complexity of the factors involved in it [8,9]. Since the IQ test imposes a financial burden on families, a large number of students are not measured in these tests. This is one of the difficulties of dealing with IQ and the factors affecting it.

### *Generalized Anxiety Disorder (GAD)*

Investigating genetic factors, cognitive challenges, and environmental agents in creating and aggravating anxiety disorders in intelligent students with high IQ has a special role in treatment of the GAD disorder. It seems

that due to the high awareness of the surrounding events, they face challenges that manifest as anxiety disorders. Anxiety disorder in intelligent students is also associated with a variety of lifestyles. The state of anxiety in parents is associated with a greater risk of anxiety problems in intelligent students [1,10]. Excessive support and attention or rejecting and leaving the intelligent student to himself, all have a direct effect with the occurrence of social anxiety disorder (SAD) and strengthen the GAD background in them. Parents' differences with each other or with teenagers have a direct effect with the occurrence of anxiety disorders. Anxious parents transmit a wrong model of how to face life's challenges to their teenager [11].

### *Adolescence and Behavioral Complications*

The process and characteristics of development in the group of adolescents exposed to GAD show different psychological and social consequences compared to the control samples that do not have GAD disorder. Based on data analysis, the GAD has a variable trend, downward trend at the beginning and upward trend in the middle of adolescence [12].

### *Effect of Temperament on Individual and Social Behavior*

According to traditional Iranian Islamic medicine, humans have four types of temperament that may change during life. Temperaments include: sanguine, phlegmatic, choleric and melancholic. Sanguine people have a warm and humid nature and large body with enough energy and an easy-going spirit. Melancholic people have a hot and dry nature, thin body (tall or short) with enough energy and a strict spirit. Choleric people have a cold and dry temperament, short and thin, low energy, isolated, obsessive with a sensitive and fragile spirit. Phlegmatic people have a cold and moist nature, fat (tall or short) with low energy and a carefree and easy-going spirit [13].

## Experimental

In this study, a number of intelligent students in one of gifted schools were evaluated in an inconspicuous way. The results of this evaluation included the selection of forty intelligent students with almost the same educational performance, studying and examining their behavior and academic performance during a semester. Due to the high cost of the IQ test and lack of financial ability of most students, it was not possible to take the IQ test. On the other hand, this study was basically an inconspicuous study and it was supposed to be evaluated without inducing double anxiety in the students and without imposing any cost. Therefore, the IQ level of the students was evaluated only based on the opinion of their math teacher and according to the educational performance during a semester. Also, the level of GAD in them was initially done by classroom anxiety measure (CAM) questionnaire [14]. Likewise, the opinion of teachers, psychology experts and school counselors were used to confirm the anxiety disorder in selected students. This work lasts for 6 months.

### *Student with High IQ*

First, forty students of seventh grade with high intelligence were selected based on the educational performance in a semester especially the score of math course and according to the opinion of math teachers. During a semester, these students had a higher level of understanding of mathematical courses than the rest of the students. They had higher educational performance in most subjects near to 100%. Also, according to the opinion of mathematical teachers, they had a better understanding of mathematical lessons. It means that to get better grades, they not only tried, but also took advantage of their high level of intelligence.

### *Two Groups, Healthy or GAD*

Selected students with high intelligence were tested for GAD in the CAM test [14]. Initially, they have been referred to test session in school in a calm and stress-free atmosphere

and at sufficient distances from each other. They were informed that participation in the CAM test is completely optional and voluntary because it does not affect their grades. Before the test, they were fully informed about the answer method. The test had 20 questions with 5 options. They had only 20 minutes opportunity to answer. They were allowed to leave test session quietly if they finished the CAM test earlier than 20 minutes.

In this test, 20 simple questions were asked to the students and they were asked to rate their general condition in response to the questions, including: 1) I feel worried, 2) I feel uncomfortable, 3) I am calm, 4) I feel comfortable, 5) I feel anxious, 6) I feel confident, 7) I feel scared, 8) I feel confused, 9) I am restless and nervous, 10) I am cool, 11) I am insecure, 12) I feel satisfied, 13) I feel safe, 14) I am flurry, 15) I am cheerful, 16) I am happy, 17) I feel depressed, 18) I feel pleasant, 19) I feel good, and 20) I do not feel confident. The CAM test answers were in the form of five options, which include; 1) Strongly disagree, 2) Disagree, 3) No Idea, 4) Agree, and 5) Strongly agree. There are two categories of items, questionnaire negative item (QNI) and questionnaire positive item (QPI). The QNIs included 1, 2, 5, 7, 8, 9, 11, 14, 17, and 20 items, and the QPI included 3, 4, 6, 10, 12, 13, 15, 16, 18, 19 items.

### *Determination of Basic Temperament*

All forty students participating in the CAM test were evaluated by a temperament expert. Their temperament was determined based on their appearance, the amount of group activity in school, and the amount of participation in extracurricular activities. All the stages of determination of temperament were done in an inconspicuous manner.

### *Consultant's Opinion*

All the students selected in this study were subjected to a detailed psychological evaluation during a semester by school psychologist expert. Likewise, their records were cited in school psychology counseling sessions before

starting this study. These students were studied for communication problems with friends, teachers, family, and school environment in a period of six months.

## Results and Discussion

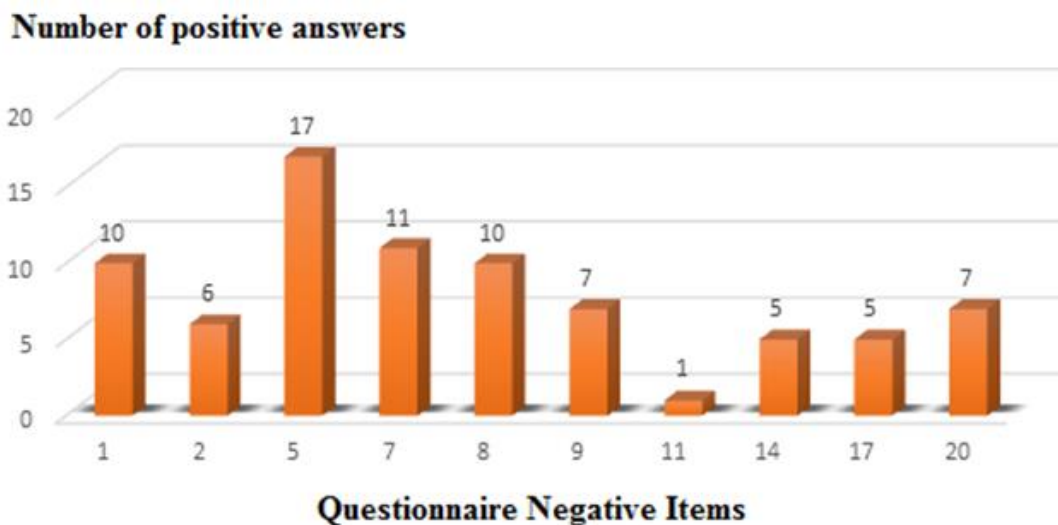
### Answers to Questionnaire Positive and Negative Items

In classification of answers, two positive answers [agree and strongly agree] were considered equally. Likewise, two negative answers [disagree and strongly disagree] were considered equally. The answer [no idea] was not considered in the divisions. Students were divided into anxious and less anxious groups based on positive answers to QNIs and negative answers to QPIs. 22 students (60%) gave the most positive answers to QNIs. They were considered students with GAD. 15 students (40%) gave the most negative answers to QNIs. They were considered students with less anxiety disorder and control group. This method is often used to diagnose the GAD in CAM test [14]. One of the students was removed from the group due to not providing specific

information and registering the answer [No Idea] for most of the items. Similarly, 2 students were excluded from the study due to underlying diseases.

### Positive Response to QNIs

In Figure 1, the number of GAD students can be seen which responded positively to QNIs. The most of them (17 people) have responded positively to item 5. In this item, the phrase [I feel anxious] is explicitly mentioned. After that, the most positive answers are related to item 7 with the phrase [I feel scared] and item 1 with the phrase [I feel worried] and item 8 with the phrase [I feel confused]. These three items also clearly measure the feeling of anxiety, scare, worry, and confusion as the main negative items in the CAM questionnaire at this research. Item 11, which assessed the feeling of insecurity in the candidates, has the lowest response rate among other QNIs with only one positive answer. Items 14 and 17, which measure the feeling of flurry and depression in the students, have received the same positive response.



**Figure 1.** Positive response of GAD students to QNIs

According to Figure 2, the amount of positive responses in the control group to the QNIs is very low and in the range of 1 to 2 positive responses. Only two positive responses to item 17 can be seen with the item [I feel depressed]. Item 2, 11, and 14 have only one positive

answer which is concern to uncomfortable, insecurity and confusion feeling in CAM test [14].

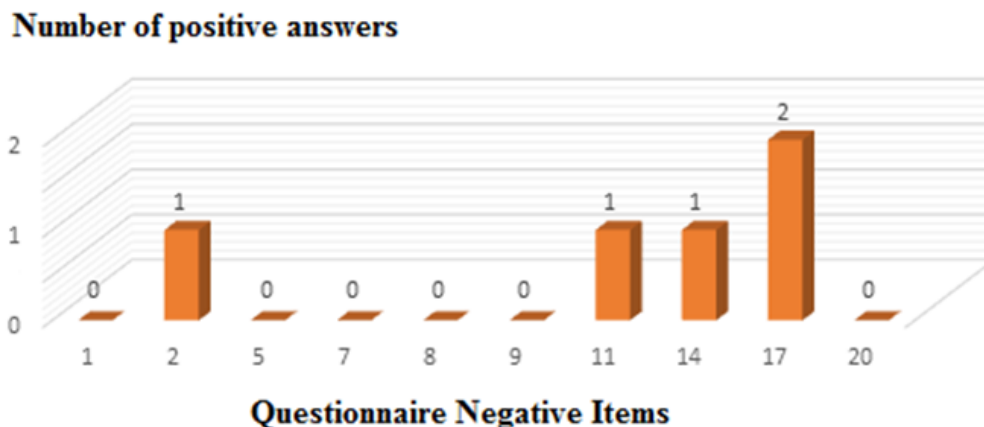


Figure 2. Positive responses of control group to the QNIs

*Positive Response to QPIs*

Figure 3 shows the positive responses of GAD students to QPIs. Items 6 and 13, which are related to the feeling of confidence and safety, have the highest frequency of responses among other QPIs. After that, the items 16, 18, and 19 are in the second stage of selection which are related to happiness, pleasant and good feeling. The items 3, 12, and 15 are in the third stage of

selection with calm, satisfy and cheerful feeling. Among the QPIs, item 4 and 10, which measure the level of comfort and cooling in GAD students, had the lowest positive response [14]. The selection of items with the same concept was to evaluate the level of students' understanding of words with the same concept. Therefore, the control group gave more positive answers to QPIs.

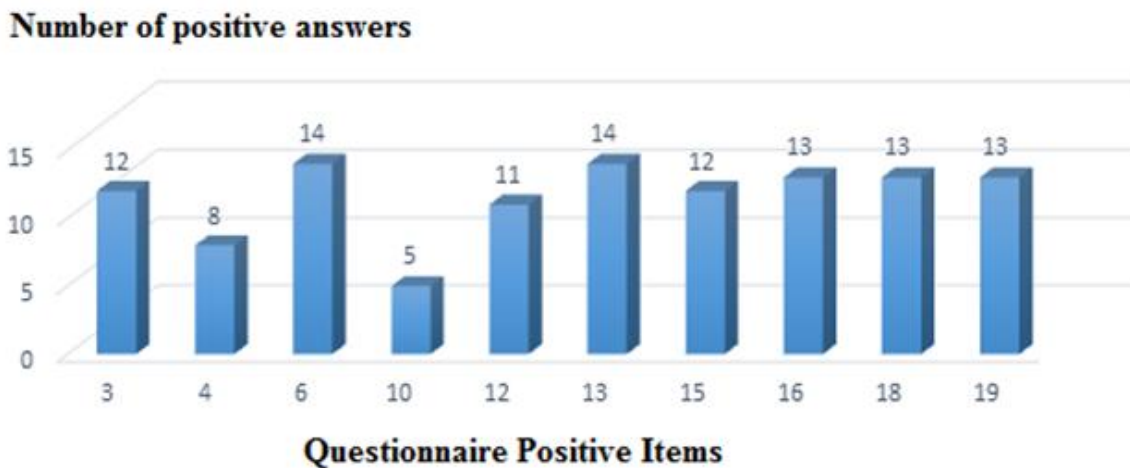


Figure 3. Positive response of GAD students to QPIs

The number of positive responses of the control group to the QPIs is demonstrated in Figure 4. The frequency of positive responses to items 12 and 13 is higher with the feeling of satisfaction and safety [12]. Items 6, 15, 16, and 18, which were related to confidence,

cheerfulness, happiness, and pleasant feeling, are in the second stage. Items 3, 4 and 10, which are concerned to the calm, comfortable and cool feeling, are in the third stage. Item 19, which is related to [I feel good], is in the last stage [14].

### Number of positive answers

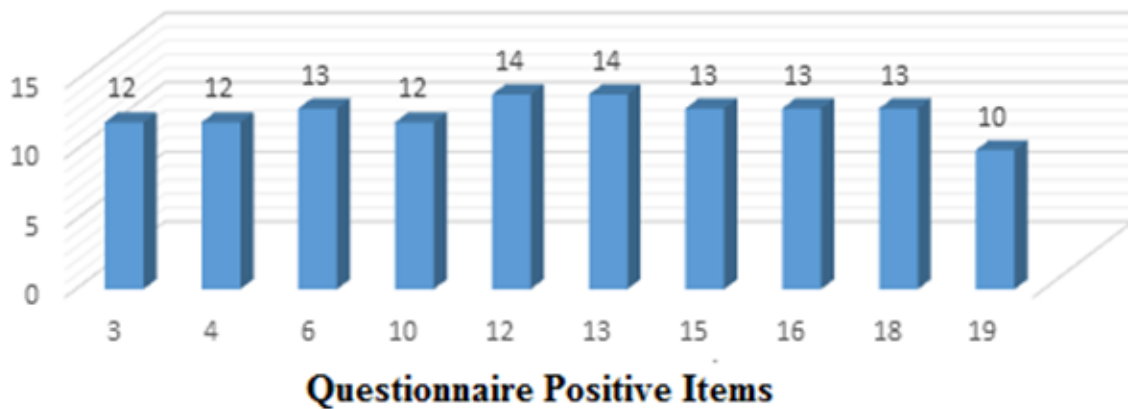


Figure 4. Positive responses of control group to the QPIs

### Statistical Comparison of Responses to QNIs and QPIs in Two Groups

According to Figure 5, there is a significant difference between the two test groups. Among GAD students, there is no uniform trend in the QNIs selection. On the other hand, the control group uniformly disagreed with the QNI items. At a glance, the most positive response of GAD

students is to item 5, which directly refers to the phrase [I have anxiety]. Item 11 is significant for the feeling of insecurity had the same positive response in both groups. In the same way, the positive response to the QPIs does not show a uniform trend among the GAD group [11-13]. While in the control group, similar to what was seen in Figure 6, there is a uniform trend in response.

### Number of positive answers

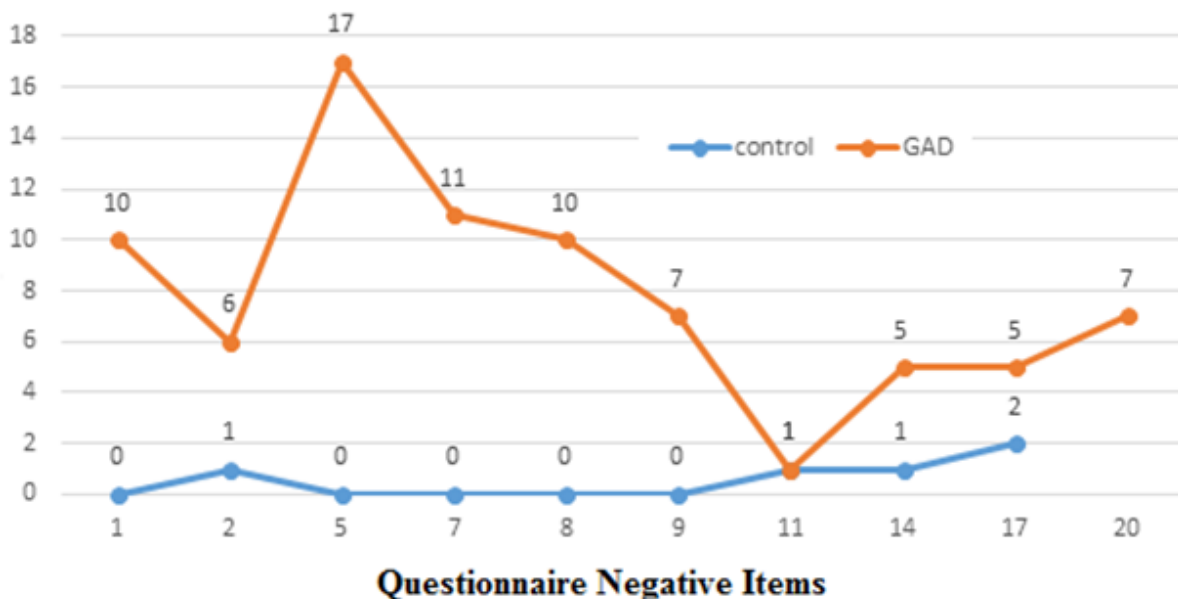
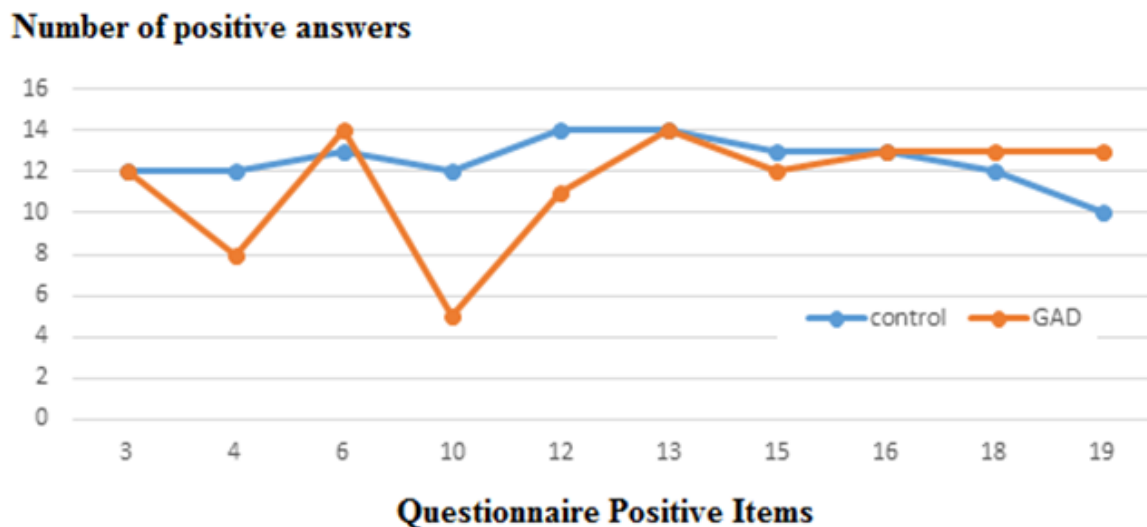


Figure 5. Comparison of positive response of GAD and control group to QNIs



**Figure 6.** Comparison of positive response of GAD and control group to QPIs

From the analysis of the two graphs and comparing the amount of positive responses to the QPIs, it can be concluded that the frequency of responding to the items related to positive emotions in the student of the control group is more than the GAD students and it has a linear trend [14]. This means that GAD students experience less positive emotions than the control group [1-3]. In general, the frequency of positive responses to the items that measure negative emotions was higher in students diagnosed with high anxiety than in students with low anxiety. It seems that GAD students experience less positive emotions than control group [14]. The general comparison of the two groups shows that most of the control group spent between 2 and 4 min answering the CAM test questionnaire. They have chosen the options with more certainty and there are less errors and changes in their questionnaire answers. While most GAD students have

answered the CAM test questionnaire within 3 to 7 minutes. In the questionnaire of the GAD group, there are more errors. They seem to be obsessed with choosing answers. The GAD group answered an average of 5 out of 20 questions with the option [No Idea], while this ratio reaches 6 questions in the control group. According to Table 1, the number of positive responses to the QNIs was obtained separately in the two groups of the GAD and the control group. From the analysis and examination of the results of statistical data in two research groups, it was found that all the obtained coefficients were significant ( $p > 0.05$ ), which indicates a positive correlation between anxiety and positive response to negative items. However, in control group compared to the GAD group the frequency of responding to the QNIs is lower, which means that fewer students answered positively to these items [13-14].

**Table 1.** Statistical result of positive response to QNIs

Students	Average	Variance	Deviation
GAD	7.9	17.09	4.35
Control	0.7	0.67	0.78

### Exclusive Comparison

The average of mathematical scores was 19.88 for the GAD group and 18.79 for the control group. According to the teachers, the GAD group was noticeably stronger and more

successful than the control group in understanding mathematical concepts and solving complex problems. Also, the GAD group had significantly better research and group activities than the control group. They were more willing to compete and get top ranks in

intra-school competitions and festivals [1]. However, according to the opinion of the school psychologist, the control group often behaves more harmoniously with their school friends and family members, and there are fewer reports of family discord. But in the GAD group, they behaved differently with their friends and family. They were between the two extremes of being shy or very social. They had controlling parents (helicopter parents), and perfectionists [4-6]. The students of the control group were mostly in the category of low-achieving gifted students. Statistics of mood disorders and depression in both groups were low and to the same extent in the GAD and control group. According to the family report, one of the students with GAD had symptoms of panic disorder and had a history of panic attacks.

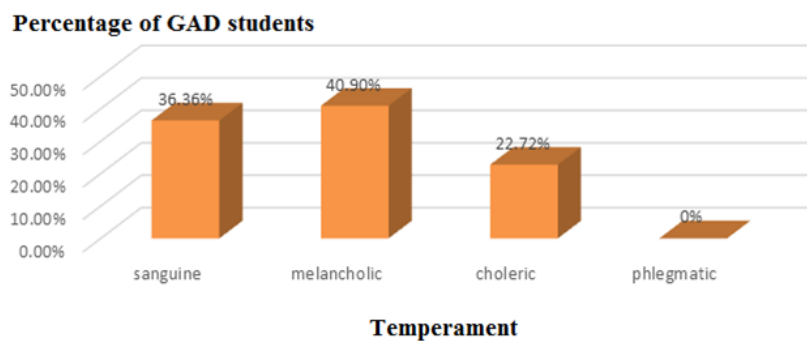
Except for that case, the others did not have any special psychological history in their case.

*Basic Temperament in GAD and Control Groups*

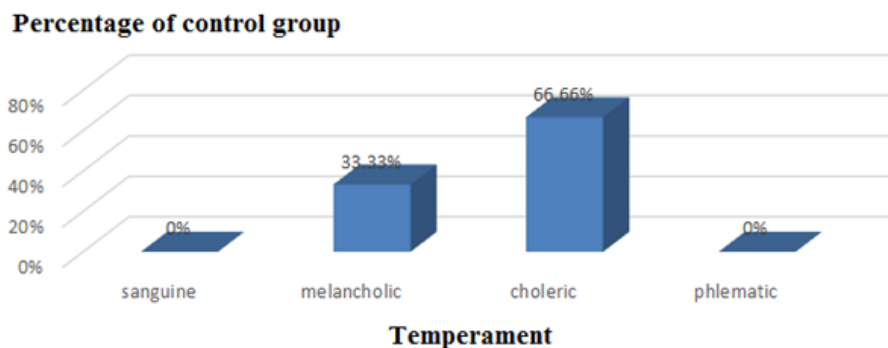
The results of temperament in Table 2 showed that 40.90% of GAD students had a melancholic temperament, and then temperaments of sanguine and choleric were determined with 36.36% and 22.72% respectively among the GAD students, Figure 7. On the other hand, the highest temperament in control group was choleric with 66.66% followed by melancholic with 33.33%, Figure 8. The temperament of phlegmatic was not observed in the GAD and control group. Also, among the control group, no student with a sanguine temper was observed.

**Table 2.** Percentage of temperament in GAD and control group

Students (NO.)	Sanguine	Melancholic	Choleric	Phlegmatic
GAD (22)	8(36.36%)	9(40.90%)	5(22.72%)	0.00%
Control (15)	0.00%	5(33.33%)	10(66.66)	0.00%



**Figure 7.** The percentage of temperaments in the GAD group



**Figure 8.** The percentage of temperaments in the control group



## Conclusion

This study was conducted on forty intelligent students in gifted school who had obtained the highest grades during a semester. They were subtly monitored for educational performance, social behavior, and family relationships. Finally, they were evaluated for GAD by the CAM test. Based on the percentage of answers to QNIs, students were divided into two groups with GAD and the control group. The result of this study showed a significant relationship between higher IQ and GAD. The GAD students were often melancholic and sanguine, while the control group was more choleric and then melancholic. In terms of social activity and success, GAD students were more successful than the control group. However, the GAD students had less benefit from positive and pleasant emotions. In addition, the GAD students had a different and contradictory understanding of the same concepts, which indicates their momentary decisions in choosing options. This finding is consistent with what was observed in the CAM test questionnaire because they were more obsessed in choosing the answer. According to the report of the school psychologist, the GAD students had more compulsive obsessions. Furthermore, family problems were significantly higher in the GAD group.

## Acknowledgments

The author would like to thank all those who helped me in this study. I am sincerely grateful to Dr. Farideh Babaei for her spiritual support and to Dr. Ashraf Heidaripour for her scientific support for this study.

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