Gelotophobia in High-Functioning Adolescents with Autism Spectrum Disorder

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Abstract

The study aimed to investigate the prevalence rate and level of gelotophobia among adolescents with high-functioning autism spectrum disorder (hfASD) and identify the differences in gelotophobia considering various demographic variables. The descriptive approach was employed in this study. The participants consisted of 76 adolescents with hfASD who experienced gelotophobia. They were selected from a large group of 181 adolescents enrolled in preparatory and secondary stages in Cairo, Egypt. The age range of the participants was 13 to 17 years. Among the participants, there were 31 males (40.79%) and 45 females (59.21%). The Gelotophobia Scale, developed specifically for this study, was utilized for data collection. The results indicated a gelotophobia prevalence rate of 41.98% among adolescents with hfASD. Additionally, the participants exhibited a moderate level of gelotophobia. Furthermore, the findings demonstrated differences between males and females in the manifestation of gelotophobia, with a higher incidence observed among females. This gender difference may be attributed to the fact that females are often subjected to experiences of harassment, particularly during adolescence, which may result from physical attributes such as obesity or excessive thinness, thus contributing to the development of gelotophobia. However, no significant differences in gelotophobia were found based on participants' age. Further research is needed to explore additional factors influencing gelotophobia in this population.

Keywords: high-functioning autism spectrum disorder, gelotophobia, adolescence, social phobia

Introduction

In general, laughter and humor are globally recognized as positive phenomena, often considered the best remedy to confront life's difficulties and challenges. They serve as social signals with predominantly positive emotional connotations. However, it is important to acknowledge that laughter and humor can also carry negative implications and be employed as a means of mocking others (Brauer et al., 2022).

Some individuals encounter difficulties in distinguishing between the various connotations of laughter, regardless of whether it is positive or negative. These individuals tend to interpret all forms of laughter they encounter in different situations as negative. They perceive this laughter as directed towards them, viewing it as a threat and a form of mockery. Consequently, they tend to withdraw and isolate themselves (Canestrari et al., 2021).

It is a natural response for an individual to experience negative emotions such as embarrassment, anger, and disgust when subjected to ridicule by others in a given situation. However, most individuals can adapt and modify their behavior to fit the circumstances. Conversely, there exists a distinct group of individuals who struggle to cope with such situations. They hold the belief that others ridicule them due to their perceived social incompetence, leading to a fear of social interactions and a consequent desire to isolate themselves to avoid being subjected to laughter and ridicule (Leader et al., 2018; Murray et al., 2021).

Typically, individuals can discern between friendly and hostile intentions through various forms of laughter. However, some individuals may struggle to recognize the positive aspects of laughter and tend to interpret others' laughter as a form of mockery directed at them. Consequently, they internalize a belief that they are being ostracized and hated by others, resulting in feelings of shame and disgrace. As a result, they often prefer isolation and actively avoid social situations. (Sicorello et al., 2021).

Autism Spectrum Disorder (ASD) is “a heterogeneous neurodevelopmental disorder characterized by a pervasive impairment in reciprocal and social communication and interactions, restricted and repetitive patterns of behavior, interests, or activities, and lack of socio-emotional reciprocity and impaired sensory integration processing and

can present with different grades of symptom severity and with or without intellectual impairment" (Cremone et al., 2023, p. 1).

Results of many studies have indicated the association of ASD with many disorders and problems, and among these studies is the study of Fucà et al. (2023), whose results generally indicated the suffering of individuals with hfASD from some comorbidities such as attention deficit hyperactivity disorder, anxiety disorders, and obsessive-compulsive disorder.

Individuals with ASD suffer from deficits in social communication and social cognition. Therefore, they may face difficulties and problems in empathy as a result of the deficiency of their theory of mind, which impedes their ability to distinguish between the mental state of themselves and the mental state of others. They also have difficulty perceiving and understanding nonverbal cues, humor, and laughter. Therefore, there may be a relationship between gelotophobia and ASD (Leader & Mannion, 2021).

Gelotophobia is a new area that needs more research in the future. A better and clearer understanding of the relationship between gelotophobia and bullying, social functioning, perceived social support, comorbid psychological disorders, and quality of life is urgently needed. Gelotophobia is a new and developing area of autism research, as more research is expected to be conducted in the coming years on that kind of phobia, particularly among individuals with hfASD (Grennan et al., 2018). According to the aforementioned, the current study is concerned with studying gelotophobia in individuals with autism disorder.

Statement:

Specialists, experts, and professionals in the field of gelotophobia need to broaden their research to include individuals with hfASD. Researchers in the field of ASD also need to be fully aware of gelotophobia and incorporate it as a potential comorbidity into their research. By doing this, the relationship between ASD and gelotophobia can be identified and better understood, which will have a significant positive impact on interventions aimed at improving social and job skills, employment programs, and vocational programs for individuals with ASD (Grennan et al.,2018).

The results of a limited number of research studies conducted on gelotophobia among individuals with ASD have indicated (Samson

et al., 2011; Wu et al., 2015; Grennan et al., 2018; Tsai et al., 2018) that individuals with ASD experience higher levels of gelotophobia compared to normal individuals, and that social performance, previous experiences of bullying, anxiety, and life satisfaction were among the most important predictors of gelotophobia in adults with hfASD.

According to the scarcity of research focused on the study of gelotophobia in individuals with ASD, there is a need to conduct future research and studies on ASD groups. Future research and studies should also try to understand the relationship between gelotophobia and the severity of ASD (Abdel Razek & El Tohamy, 2023).

From the aforementioned, the problem statement of the study can be summarized in the following questions:

Q1: What is the prevalence rate of gelotophobia among adolescents with hfASD?

Q2: What is the level of gelotophobia among adolescents with hfASD?

Q3: What are the differences between the mean scores of male and female adolescents with hfASD on the gelotophobia scale?

Q4: What are the differences between the mean scores of each of the adolescents with hfASD in the early and late adolescence stages on the Gelotophobia scale?

Theoretical Background:

Gelotophobia refers to the misinterpretation of friendly laughter as maliciousness and a threat by others (Ruch et al., 2017). Gelotophobia is defined as the individual's fear of being a target of laughter or ridicule by other individuals, as they do not understand what positive, gentle laughter and sarcasm are, as they cannot distinguish between them and negative laughter and sarcasm, and believes that any laughter is directed at them in a negative, cunning and malicious way, which results in their fear of being with others (Kohlmann et al., 2018). Gelotophobia is also defined as an intense fear of ridicule from others, not realizing the positive aspects of laughter, misreading and interpreting signs and gestures, and believing that any form of laughter is a threat or ridicule (Sicorello et al., 2021).

Many reasons and factors play a major role in the growth and development of gelotophobia, and these factors can be classified into family factors such as negative parenting styles; external factors such as experiences of harassment and abuse during childhood, adolescence, and adulthood in school, work or social life; and personal factors such

as height, physical deformity, speech and language problems, thinness, obesity, and mental disorders. It should also be emphasized that exposure to laughter over long periods is one of the main causes of gelotophobia (Titze & Kuhn, 2014; Vagnoli et al., 2021; Canestrari et al., 2021).

It is worth noting that gelotophobia negatively affects all aspects of development in individuals who suffer from it. For example, some physiological symptoms may appear due to gelotophobia, such as cramping, muscle spasms, and facial redness (Ruch et al., 2014; Leader et al., 2018). The results of many studies have indicated that individuals with gelotophobia suffer from a decrease in body admiration and an increase in body shame. They have negative beliefs about themselves, low self-esteem, a sense of anxiety and tension, and face problems in maintaining relationships with others, deficiency in social skills, avoidance of social interaction situations, a lack of confidence in themselves and their abilities, and distrust of others. This may lead to a decrease in their well-being and quality of life (Ruch et al., 2014; Leader et al., 2018; Cortello, 2019; Barabadi et al., 2021).

Literature Review

Many studies have studied the relationship between gelotophobia and some variables in normal people. Among these studies are Brauer and Proyer (2018) and Torres-Marín et al. (2020), whose results indicated that gelotophobia is associated with significant feelings of shame, distorted body image, poor psychological well-being, increased sensitivity to negative emotional states, and lower levels of satisfaction in social relationships. Canestrari et al. (2021) indicated that gelotophobia mediates the relationship (mediator variable) between cyberbullying and parental attachment and that gelotophobia is positively associated with exposure to cyberbullying via the Internet in a sample of young adults with an average age of 20 years. Dursun et al. (2020) also indicated that gelotophobia was associated with low self-esteem, high levels of sadness and psychological distress, and a deficiency in social functions, adaptation, and dealing with humor. Vagnoli et al. (2021) also confirmed the existence of a negative relationship between gelotophobia and dealing with and adapting to humor in females and males at the age of 18 years. Vagnoli et al. (2022) indicated that gelotophobia was negatively

associated with patterns of friendly humor, self-enhancing humor, and aggressive humor.

The results of many studies have indicated that gelotophobia is linked to introversion, neuroticism, a lack of emotional regulation skills, and an openness to experience. It is also negatively associated with hope, curiosity, courage, love, vitality, belonging, and self-reinforcement. It is positively associated with humility, prudence, and wisdom. Individuals with gelotophobia also scored lower on openness, agreeableness, and conscientiousness (Tagalidou et al., 2019; Cortello, 2019; Dursun, et al., 2020). Proyer and Ruch (2009) indicated that there is a negative correlation between gelotophobia and personality strengths, and individuals with gelotophobia showed low scores on measures of courage and optimism. They also tend to have low self-esteem about their abilities and therefore underestimate their true capabilities. Brauer et al. (2021); Ďurka and Ruch (2015); and Torres-Marín et al. (2019) indicated that individuals with gelotophobia have a high degree of neuroticism along with a decrease in extraversion and openness to new experiences. Gelotophobia was positively associated with psychotic symptoms in individuals with gelotophobia.

There are very few studies that have dealt with the study of gelotophobia in individuals with ASD, and among these studies is the study of Samson et al. (2011), whose results indicated that individuals with Asperger syndrome suffered greatly in their childhood from gelotophobia compared to normal individuals. Also, individuals with Asperger syndrome are less able to laugh at themselves (gelotophobia) compared to normal individuals, and there are no differences in enjoying laughing at others (katagelasticism) between individuals with Asperger syndrome and normal individuals. The results of the study also indicated that about 45% of individuals with Asperger syndrome suffer from gelotophobia to a large extent, compared to about 6% of normal individuals who suffer from gelotophobia to a slight degree. Wu et al. (2015) revealed that students with ASD showed a higher level of gelotophobia (fear of being ridiculed) compared to normal students, but they did not show any differences between them and normal students in enjoying laughing at others (katagelasticism). The results of the study also indicated that gelotophobia among students with ASD is related to attachment to fathers and not to mothers, which indicates the role of parental interactions in the development of gelotophobia. To decrease

the tendency that individuals with autism have towards exhibiting gelotophobia, this study suggests improving child-father interactions through parent education.

Leader et al. (2018) also confirmed that adults with hfASD suffer from higher rates of gelotophobia (87.4%) compared to normal adults (22.6%). Social performance and previous experiences of bullying, anxiety, and life satisfaction were the most important predictors of gelotophobia in adults with hfASD. The results of the Tsai et al. (2018) study revealed that individuals with ASD have a higher level of gelotophobia than normal individuals, but they have a lower level of catagelastics and gelotophilia compared to normal people, and individuals with ASD have lower levels of extraversion and agreeableness than normal individuals. Moreover, there are no differences in conscientiousness, openness, or emotional stability between individuals with ASD and normal individuals. The results of the study also indicated that extraversion is a direct factor in the occurrence of gelotophobia in individuals with ASD and that gelotophobia was partially affected by ASD but was also affected to some extent by the level of extraversion. Finally, ASD and the level of adjustment are incompatible when predicting the level of katagelasticism (the enjoyment of laughing at others).

The results of the Murray et al. (2022) study also confirmed the prevalence of symptoms of gaming disorder among individuals with ASD to a large extent of 9.1% compared to normal individuals, which amounted to 2.9%, and that individuals with ASD are more likely to develop gaming disorder compared to normal individuals. In addition, the variables of introversion, alienation, and emotional reorganization are among the biggest predictors of gaming disorder. The results of the study also indicated that there is an association between gelotophobia and gaming disorders but with a small effect size.

It is worth noting that some studies focused on the treatment of gelotophobia in mothers of children with ASD, including the study of Ghamarani and Mohseni-Ezhiyeh (2017), whose results indicated the effectiveness of transdiagnostic treatment in reducing the severity of anhedonia with its four components (social interaction, sensory experience, eating and drinking, interest, and entertainment), as well as reducing the severity of gelotophobia in mothers of children with ASD.

Procedures

Methodology

The current study relied on a descriptive approach. This approach aims to verify the prevalence of gelotophobia among adolescents with hfASD as well as identify the differences in gelotophobia considering some demographic variables.

Population and Participants

The study population consisted of all adolescents with hfASD in Cairo Governorate, Arab Republic of Egypt. The study sample consisted of:

1- The psychometric study sample consisted of 105 adolescents with hfASD, enrolled in the preparatory and secondary stages, whose ages ranged from 13 to 17 years of age, with an average age of 14.65, to verify the psychometric characteristics of the study tool.

2- The sample of the descriptive study consisted of 76 adolescents with hfASD who suffer from gelotophobia. They were chosen from a basic sample of 181 adolescents enrolled in the preparatory and secondary stages in Cairo Governorate in the Arab Republic of Egypt. Their ages ranged between 13 and 17 years of age. They were 31 males (40.79%), and 45 females (59.21%).

Instrument

Gelotophobia Scale (developed by the researchers): Researchers developed this scale to identify adolescents with hfASD who suffer from gelotophobia. This scale was developed due to the lack of scales within the knowledge of researchers dedicated to diagnosing gelotophobia in adolescents, and it passed through the following stages to be developed:

First, exploring the psychological literature that dealt with gelotophobia in particular, and among these studies Proyer et al., 2012; Ruch, and Proyer, 2009; Ruch et al., 2017; Torres-Marn et al., 2019; Vagnoli et al., 2021. Researchers have noticed a scarcity of scales that address the diagnosis of this gelotophobia. Then the operational definition of gelotophobia was determined, and an open questionnaire was applied to psychologists about their concept of gelotophobia, its manifestations, and how to identify it. Considering this process, a preliminary version of the scale consisting of 20 items was prepared to

identify adolescents who suffer from this gelotophobia. Response alternatives to the scale were determined through a pilot study on a sample of five adolescents with hfASD who were not the primary sample for the research. The results indicated their understanding of the scale items and the 4-point Likert scale alternatives (strongly agree, somewhat agree, somewhat disagree, and strongly disagree) at a rate of 75%. These responses are given scores of (4, 3, 2, 1), respectively, and the high score indicates that the person suffers from gelotophobia. Clarity, brevity, and simplicity were considered in the scale's instructions. The researchers relied on previous studies, including Dursun et al. (2020) and Ruch et al. (2017), in determining the response alternatives on the scale. The scores of the scale items were calculated. The score from 1 to 2.49 means there is no gelotophobia; from 2.5 to 2.99, gelotophobia is at a mild degree; from 3 to 3.49, gelotophobia is at a significant degree; and from 3.5 to 4, gelotophobia is at a severe degree. Given that the researchers did not adopt a specific theory in developing the scale but relied on previous studies, theoretical frameworks, and previous scales, it was, therefore, preferable to develop the scale and subject it to exploratory factor analysis to determine its various dimensions**.**

Second, the scale was presented in its initial form to five specialists in the field of mental health and those working with adolescents with ASD to demonstrate the suitability of the scale items for the participants. This step resulted in maintaining all the scale items while modifying some items to the cultural and social environment of the research participants.

Third, to verify the psychometric properties of the scale, it was applied to a psychometric sample other than the primary research participants, which consisted of 105 adolescents with hfASD. The following psychometric properties were calculated:

1- Internal consistency: The correlation coefficient was calculated between the score of each item and the total score of the scale, as shown in Table 1:

Table 1. Correlation Coefficient Between Each Item and The Total Score of The Scale

Item	correlation coefficient	Item	correlation coefficient	Item	correlation coefficient	Item	correlation coefficient
1	.877**	6	.860**	11	.976**	16	.933**
2	.767**	7	.932**	12	.969**	17	.860**
3	.306**	8	.967**	13	.970**	18	.924**
4	.876**	9	.984**	14	.943**	19	.893**
5	.352**	10	.950**	15	.955**	20	.847**

** significant at 0.01

It is clear from the results presented in Table 1 that the correlation coefficients between the score of each item and the total score ranged between 0.306 and 0.984, and they are statistically significant at the level of 0.01.

2- Exploratory factor analysis: An exploratory factor analysis was conducted to verify the factorial structure of the scale on a sample of 105 adolescents using the principal components method. The "Kaiser" criterion was also used to extract the general factor, which is a root of no less than one. Then the extracted factors were rotated orthogonally using the "Varimax" method, and the acceptable saturation of the item was considered to be at least 0.3. Table 2 shows the results of the factor analysis.

Table 2. Results of The Factor Analysis

Item	Degree of saturation (factor 1)	Communalities	Item	Degree of saturation (factor 1)	Communalities
1	.874	.780	11	.977	.958
2	.762	.675	12	.971	.944
3	.706	.684	13	.972	.945
4	.877	.769	14	.945	.897
5	.346	.670	15	.957	.918
6	.859	.744	16	.934	.873
7	.933	.880	17	.860	.757
8	.969	.951	18	.924	.858
9	.986	.974	19	.892	.807
10	.951	.910	20	.845	.747

By exploring the results presented in Table 2, the saturations of all items are higher than 0.3, as they ranged between 0.346 and 0.986. The factor analysis also resulted in the extraction of one factor that explained 76.876% of the total variance and amounted to a latent root value of 15.375.

Reliability of the scale: To verify the reliability of the scale, Cronbach's alpha and split-half methods were used. The scale has a high degree of reliability, as the value of the alpha coefficient reached 0.979. As for the Gitman split-half method, it reached 0.989, which proves the stability and reliability of the scale.

Validity of the scale: The validity of the scale was verified using confirmatory factor analysis as follows:

Factor validity: Factor validity was verified using first-order confirmatory factor analysis using the maximum likelihood method, which resulted in all items of the scale being saturated on one general factor. The value of the Chi-square reached 59.44, which is not a statistically significant value. This confirms the quality of the data's fit with the proposed model. Figure 1 shows the schematic path of the confirmatory factor analysis model for the variables that saturate the latent factor on the gelotophobia scale.

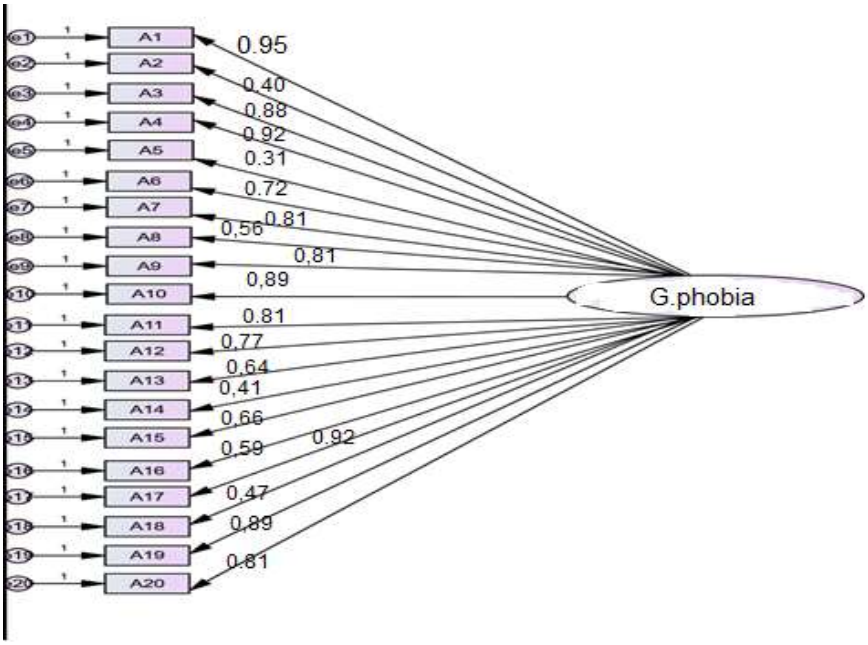

Figure 1. Confirmatory factor analysis model for the gelotophobia scale

Chi-Square = 44.59, Df = 000, RMSEA = 0,000, GFI = 0,000, AGFI = 0,000.

It is clear from Figure (1) that the values of the indicators of the model fit summary were in the ideal range, and the values of saturation ranged between 0.31-0.95, which are high values. This indicates an acceptable level of model fit and proves the validity of the current scale.

Results

The result of the first question, which states: "What is the prevalence rate of gelotophobia among adolescents with hfASD?"

To address this question, the researchers relied on several diagnostic steps, as follows:

1- The symptoms appear during the six months preceding the disorder, and this criterion was determined in light of the criteria for diagnosing social phobia in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5). The researchers attribute this to the existence of several studies that classified this kind of phobia as one form of social phobia, including Havranek et al., 2017; Rose and Tadi, 2022, as well as the absence of this disorder in any of the diagnostic manuals.

2- Since there was no cut-off point in previous attempts to diagnose gelotophobia, the researchers preferred to rely on both the mean and the standard deviation in diagnosing gelotophobia among the study participants. This was done by identifying the person suffering from gelotophobia as the one who deviates by two degrees from the average in the total score and the mean value reached (43 degrees).

3- In light of the aforementioned, the cut-off point necessary to diagnose gelotophobia was (45 degrees), and the number of adolescents suffering from gelotophobia was (76 adolescents) out of a total of (181 adolescents) on whom the scale was applied at a rate of (41.98%), and their scores varied on the scale between (45-91 degrees) with an average of (62 degrees), of whom (45) were females with a rate of (59.2%), while the number of males was (31) males with a rate of (40.8%). The number of individuals infected with gelotophobia in early adolescence was 49 adolescents aged between 13 and 14 years of age, at a rate of 64.5 percent, while the number of individuals infected with gelotophobia in late adolescence was 27 individuals aged between 16 and 17 years of age, at a rate of 35.5%.

The result of the second question, which states: "What is the level of gelotophobia among adolescents with hfASD?"

To address this question, the arithmetic means and standard deviations were calculated for the responses of the study participants on the items of the scale. Table 3 shows the means of the adolescents' responses to the items on the scale.

Table 3. Means and Standard Deviations of The Study Participants' Responses on The Gelotophobia Scale.

Item	Mean	Std. Deviation	Gelotophobia Severity	Item	Mean	Std. Deviation	Gelotophobia Severity
1	3.4026	.83129	remarkable	11	3.1169	.84252	moderate
2	2.8312	.78477	Mild	12	3.1169	.76044	moderate
3	2.3377	.64094	No Gelotophobia	13	3.0909	.78106	moderate
4	3.3377	.75412	moderate	14	3.1039	.78781	moderate
5	2.9351	.96433	Mild	15	3.1299	.78389	moderate
6	3.0390	.92397	moderate	16	3.3117	.74798	moderate
7	3.1299	.80050	moderate	17	3.0260	.81069	moderate
8	3.0649	.84818	moderate	18	3.4416	.75208	moderate
9	3.1169	.81069	moderate	19	3.2597	.69590	moderate
10	3.1299	.81678	moderate	20	3.1299	.86375	moderate

By examining the results presented in Table 3, it is evident that the study participants experienced a presence of gelotophobia, as indicated by the means ranging between 3.02 and 3.44. These scores suggest a moderate level of gelotophobia. Additionally, the scores for items 2 and 5 indicated a mild level of gelotophobia. However, item 3 revealed no symptoms of gelotophobia among the study participants.

The result of the third question, which states: "What are the differences between the mean scores of male and female adolescents with hfASD on the gelotophobia scale?"

To address this question, the researchers used the independent sample t-test after verifying the conditions for its use. Table 4 shows the results of that.

Table 4. Results of the T-Test for Differences in Gelotophobia According to Gender

Scale	Gender (male/ female) N=76				t	Significance Level
	Male (N=31)		female (N=45)			
	Mean	Std. Deviation	Mean	Std. Deviation		
Gelotophobia	54.26	4.91	67.80	11.15	6.339	0.001

By exploring the results presented in Table 4, it was found that the value of the "T" test for the differences between the mean scores of adolescents with hfASD on the gelotophobia scale is statistically significant in favor of females, as the differences between the means amounted to "13.54," which indicates that females suffer from gelotophobia more than males.

The result of the fourth question, which states: "What are the differences between the mean scores of each of the adolescents with hfASD in the early and late adolescence stages on the Gelotophobia scale?"

To address this question, the researchers used the independent sample t-test after verifying the conditions for its use. Table 5. shows the results of that.

Table 5. Results of the T-Test for Differences in Gelotophobia According to Age

Scale	Adolescence (early/late) N = 76				t	Significance Level
	Early adolescence (13-14 years of age) N= 49		Early adolescence (16-17 years of age) N= 27			
	Mean	Std. Deviation	Mean	Std. Deviation		
Gelotophobia	63.43	15.51	60.19	8.07	0.279	Not significant

It is clear from the results presented in Table 5 that the value of the “t” test for the differences between the means of the scores of adolescents with hfASD on the gelotophobia scale is not statistically significant, which indicates that there are no statistically significant differences in gelotophobia according to age.

Discussion

Exploring the results of the current study, it is evident that the prevalence rate of gelotophobia among adolescents with hfASD was found to be 41.98%. This finding aligns with previous studies that have explored the prevalence rates of gelotophobia within the same population. For instance, the study conducted by Samson et al. (2011) reported that approximately 45% of individuals with Asperger syndrome experience gelotophobia. Similarly, the study by Wu et al. (2015) found that students with ASD exhibited higher levels of gelotophobia compared to their typical peers. By comparing the prevalence rates obtained in this study with the results of the study by

Leader et al. (2018), it becomes clear that there are fundamental differences. Leader et al.'s study indicated that the prevalence rates of gelotophobia reached 87.4%, which is an extreme percentage. This may be attributed to the nature of the participants with whom the study was conducted. The results indicated that the participants had been exposed to bullying and suffered from high levels of anxiety.

The reasons for the high prevalence of gelotophobia among adolescents with hfASD can be attributed to the fact that they have difficulty perceiving and understanding non-verbal cues, and therefore they have trouble understanding humor and laughter, which was confirmed by Leader and Mannion (2021).

The causes of gelotophobia can be attributed to low social skills among adolescents with autism. This result is consistent with the results of Samson et al. (2011), Wu et al. (2015), Grennan et al. (2018), and Tsai et al. (2018). The occurrence of moderate level of gelotophobia in autistic individuals can also be attributed to their developmental characteristics, which are characterized by extreme sensitivity, feelings of shyness, and low levels of satisfaction in social relationships (Brauer & Proyer, 2018; Chan, 2016; Samson & Meyer, 2010; Torres-Marn et al., 2020). One of the reasons that can be attributed to the emergence of gelotophobia in adolescents with hfASD is the use of inappropriate parental treatment methods for this group of adolescents. This result is confirmed by Titze, 2014; Titze and Kühn, 2014; Wu et al., 2015. These studies have found that the wrong methods of raising children, represented by excessive protection, excessive ignoring, and ridicule of children's behaviors, lead these children to use defensive tricks to avoid them, which in the future will lead to the emergence of gelotophobia among them.

Regarding the differences between males and females, the results of the current study contradict the findings of Ruch and Proyer (2008a) and Ruch and Proyer (2008b). These studies suggested that there are no significant differences between males and females in the emergence of gelotophobia and the higher degree of gelotophobia in females compared to males can be attributed to females' fear of appearing inappropriately in front of others, which increases their likelihood of developing gelotophobia (Ruch et al., 2014). The reason can also be attributed to the fact that females are being exposed to experiences of harassment, especially in adolescence, which is often the

result of some physical deformities such as obesity or excessive thinness, which leads to the development of gelotophobia (Kohlmann et al., 2018; Ruch et al., 2014).

Regarding the differences in the occurrence of gelotophobia considering the participants' age, the results of the current study agreed with the findings of Ruch and Proyer (2008a) and Ruch and Proyer (2008b). These studies concluded that there are no significant differences in gelotophobia due to age. On the other hand, these results contradict the findings of Jorm (2000); and Platt and Ruch (2010), which found that gelotophobia is high in adolescence, gradually decreases until the forties, and completely decreases in individuals over the age of sixty.

Conclusions and Recommendation

This study explored the prevalence rate and level of gelotophobia among adolescents with hfASD and examined potential factors influencing its occurrence. The findings revealed a prevalence rate of 41.98% for gelotophobia in this specific population, consistent with previous research on gelotophobia among individuals with ASD.

The discussion highlighted several factors contributing to the high prevalence of gelotophobia in adolescents with hfASD. Difficulties in perceiving and understanding non-verbal cues, including humor and laughter, were identified as key challenges for individuals with ASD. Additionally, the developmental characteristics of autism, such as heightened sensitivity, shyness, and lower levels of satisfaction in social relationships, were found to be associated with the occurrence of moderate level of gelotophobia among adolescents with hfASD.

Furthermore, inappropriate parental treatment methods, such as excessive protection, neglect, and ridicule of children's behaviors, were identified as potential factors leading to the emergence of gelotophobia in adolescents with hfASD. It is crucial to consider these factors when developing interventions to support individuals with hfASD and address their specific social and emotional needs.

Regarding gender differences, this study observed a higher degree of gelotophobia in females compared to males, contradicting previous findings. The fear of appearing inappropriately in front of others was suggested as a contributing factor for this gender difference. Moreover, experiences of harassment, particularly during adolescence,

related to physical attributes, were also associated with the development of gelotophobia in females.

Regarding age differences, the results of this study aligned with some studies that found no significant differences in gelotophobia across different age groups. However, there were discrepancies with studies indicating higher gelotophobia during adolescence, followed by a gradual decrease until middle age, and a complete decrease in older individuals.

The findings of this research have significant educational implications for adolescents with hfASD and the educational systems that support them. Firstly, the prevalence rate of gelotophobia highlights the need for increased awareness and understanding among educators, school staff, and fellow students. Educators should be educated about the potential emotional impact of ridicule or laughter on adolescents with hfASD, and schools can foster a more inclusive environment by promoting empathy, understanding, and acceptance.

The moderate level of gelotophobia suggests that adolescents with hfASD may face specific challenges within educational settings. Educators should be aware of the potential social anxiety and reluctance to engage in group activities that may arise from gelotophobia. Strategies such as social skills training, creating safe and supportive spaces for expression, and implementing anti-bullying policies can contribute to the social and emotional well-being of these students.

Collaboration between researchers, educators, and mental health professionals is crucial in translating research findings into practical educational strategies. This can involve the development of evidence-based interventions and support programs tailored to the unique needs of adolescents with hfASD. Additionally, educational policies should aim to promote inclusive education, provide professional development opportunities for educators, and allocate resources for implementing targeted interventions in schools.

In conclusion, this study contributes to our understanding of gelotophobia among adolescents with hfASD, emphasizing the importance of addressing social communication difficulties, understanding gender differences, and recognizing the impact of developmental characteristics and parental treatment methods. Further research is needed to examine these factors in more detail, considering cultural influences and exploring effective interventions to support

individuals with hfASD in managing gelotophobia and promoting their overall well-being.

Data Availability

The datasets used and analyzed for the current study are available from the corresponding author upon reasonable request. The confidentiality and security of data and materials were ensured through all stages of the study.

Declaration of Conflicting Interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

The author(s) received no financial support for the research.

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