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Multi-Logistic Regression Binary Response' Technique to determine the Problems that most affect Bullying on Students with Intellectual Disabilities from the Parents' Perspective

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Abstract--- *The research aimed to determine the factors affecting the increase in bullying phenomenon on students with intellectual disabilities from the perspective of parents in the Kingdom of Saudi Arabia. The sample consisted of (72) parents of primary and middle school students who suffer from intellectual disabilities in Asir region. A questionnaire was developed to determine the most influential problems in bullying on students with intellectual disabilities, consisting of nine phrases and all of them of binary type, and the following statistical analyzes were used (Maximum de vraisemblance -Wald-Hosmar and Lemshow-Goodness of fit). The results of the research indicated that half of the independent variables represented by (the intellectually disabled being exposed to cases of bullying inside the school, electronic bullying and the role of domestic violence and the role of electronic games practiced by peers) had a significant impact and importance in increasing bullying cases of students with intellectual disabilities in Asir region from the perspective of their parents.*

Keywords--- *Multiple Logistic Regression, Bullying, Intellectual Disability*.

I. INTRODUCTION

The field of intellectual disability has received a lot of attention in recent years, whether in terms of scientific study, or in light of the huge technological progress. This concern is due to the growing conviction in different societies that persons with disabilities, like all members of society, have the right to life and to grow to the fullest extent that their capabilities and energies enable them. Therefore, methods of dealing with them have evolved to bring them closer to the normal way of life as possible (Ahmed, 2011).

The phenomenon of bullying facing all children and students in one way or another, but a recent study found that children with intellectual disabilities are exposed to bullying more throughout their school years. Researchers have found that the risk of being bullied was 20 percent greater for children with intellectual disabilities, which makes them have difficulties in learning, in comparison with others who are able to learn enrolled in schools of intellectual education, according to what indicated the results of previous studies. The results of these studies revealed the prevalence of the school bullying problem among the intellectually disabled more than the normal students. In this context, several studies were conducted that addressed the counseling and training programs to reduce the behavior of rioters and the phenomenon of bullying among students in different stages of education such as (Salem, 2012) and (Ibrahim, 2006) and their results demonstrated the effectiveness of training and counseling programs designed to reduce bullying or riotous behavior.

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Hence, the phenomenon of bullying, with the aggression it carries, that is directed from the bullies to those with intellectual disabilities of behavioral problems, has become a problem for those in charge of the educational process at all educational levels, because of its negative effects on both the bully and the victim. This problem spreads across the different age stages and among the different groups which have intellectual disabilities, and due to the social, psychological and educational problems that result from bullying behavior, it is necessary to intervene to prevent bullying and eliminate the effects of this behavior(Tannous, 2014).

Based on the foregoing, research on mechanisms to identify the problems that most affect bullying for students with intellectual disabilities from the perspective of parents in the Kingdom of Saudi Arabia has its justifications in light of what is being presented in the field of intellectual disabilities and bullying phenomena practiced by others, and the need to develop and find new ways and means to reduce these phenomena.

II. THEORETICAL FRAMEWORK

2.1Logistics Regression Model

Rakotomalala (2009) noted that regression analysis in general is a model that analyzes and interprets the relationships between a dependent variable and explanatory variables by associating these variables with a mathematical equation that may be linear (linear regression) and may be nonlinear (nonlinear regression). After determining the shape of this relationship, we estimate the parameters of the model that express the extent to which the dependent variable is affected by the explanatory variables for the purpose of interpretation or prediction according to the nature of the study. The logistic regression model is used to predict the probability of an event by adapting the data to a logistic curve. Logistic regression uses several expected variables that can be numerical or factional. The logistic regression equation is as follows:

$$P_i = E(Y_i / X_i) = \frac{e^{(\beta_0 + \beta_1 X_1 + \ldots\ldots\ldots + \beta_k X_k)}}{1 + e^{(\beta_0 + \beta_1 X_1 + \ldots\ldots\ldots + \beta_k X_k)}} \quad \ldots\ldots\ldots\ldots\ldots (1)$$

Where:

P_i : Represents the probability of occurrence of the class or attribute i of the dependent variable.

β : Represents the parameters of the model.

The equation shows that the relationship between the dependent variable and the independent variables is nonlinear, so there are several conversions that can be made to make the relationship linear. The most common of these conversions is the Logit conversion. The previous equation takes the following form:

$L = Ln(\frac{P_i}{1-P_i}) = \beta_0 + \beta_1 X_1 + \ldots\ldots\ldots + \beta_k X_k$ .....(2) $\frac{P_i}{1-P_i}$: The percentage of probability, which is considered the cornerstone of interpreting the parameters of the model, is explained by the type of explanatory variable.

The Evaluation of the Model Parameters

The lower squares method is usually used usually to estimate the parameters of the normal regression model.

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This method is not appropriate in the case of logistic regression. Therefore, the de vraisemblance maximum method is used to find the appropriate equations, and then we solve them numerically through repetitive methods.

Evaluating the Model

Before relying on the results of the model's estimation for the purpose of interpretation or prediction, these models must undergo several statistical and standard tests that demonstrate their suitability for use. We can divide these tests into two parts:

Overall Evaluation of the Model

This is done through the quality standards of conciliation, and tests of the overall significance of the model.

Quality Standards of Conciliation

They are statistical criteria that measure the explanatory power of the model. These standards are considered as alternatives to the linear regression determinants. This is called the approximation coefficients, which are computed by comparing the explanatory power of the model without explanatory variables with the model after the introduction of explanatory variables.

Testing the overall Significance of the Model

The purpose of this test is to know the overall significance of the model parameters. In other words, are all the parameters of the interpreted variables equal to zero or there is at least one parameter that is different from zero. To perform this test, we use the same principle in the case of normal regression. We compare the expected values in the case of the model without independent variables with the expected values in the model containing the independent variables. This test is called the Hosmer and Lemeshow test.

Classification Tables

These are tables consisting of the seen classification of cases and classification generated by the model. Through these tables we can know the correct classification rate and the wrong classification rate. The higher the correct classification rate is, better the predictive ability of the model is. These tables are frequently used if the purpose of model construction is more predictive than explanatory. Parameters Significance modeling test performed to determine the statistical significance of each variable separately. The Wald test or the weighting test are usually used and each one of these tests has its own characteristics and defects. It is important to note here that the evaluation of Logit parameters is done in a maximal likelihood method; it is one of the most famous estimation methods in the statistic and measures the maximum likelihood function (M.L). The probability of viewing the n number of independent variables let it be ($P_1, P_2, P_3, \ldots\ldots\ldots\ldots, P_n$) which lies in the sample and the sum of multiplying these probabilities represents the maximum likelihood function(Ghanem&Ja'ouni, 2011):

$$M.L = prob(P_1, P_2, P_3, \ldots\ldots\ldots\ldots, P_n$$

Also, this statistical method has been linked to determine the most important factors affecting bullying on students with intellectual disabilities from the parents 'viewpoint, providing appropriate explanations for this case.

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2.2 The Concept of Disability

The human element is considered one of the important but rather the main resources for the progress and development of societies, even if this human resource is with disabilities, as he is able to provide what it can for the community in the case that the community provides him with the assistance and services he needs (Al-Sabah&Hammuz,2013).

In this sense, a person with disabilities deviates from the normal or intermediate level of a characteristic, to the degree that it requires a special service, in order to help him achieve the maximum growth and harmony he can achieve (Al-Mukainen, Al-Abdullah&Al-Najadat, 2014).

The disability is also described according to the constituent elements of it, which are represented by shortcomings, deficits and damage. The shortcoming is the loss of a substance or impaired body function. Shortcoming corresponds to either an injury such as amputation, or a deficit corresponding to an injury such as paralysis.Deficit is a partial or complete reduction in the ability to do a specific activity within normal limits, such as the inability to walk, run, or use the hands, etc.Finally the damage, which is the result of deficiency or impotence, and is the cessation of the ability to carry out normal social work such as pursuing studies or exercising and others (Hasan, 2010).

Types of Disabilities

The meaning of disability is clear through the presence shortcomings and deficits of capabilities that prevent carrying out an activity completely and naturally as a result of this disability, which is divided into several types including: intellectual disability, hearing disability, physical disability, linguistic disability, visual disability, multiple disability. The following is an illustration of each of these types (El-Baz,2014).

1. **Intellectual disability**: It is a deficiency in mental functions, and the symptoms of this disability appear during the period of individual development, and its symptoms are low mental performance in conjunction with a deficiency in some adaptive skills represented in communication, self-care, home life, independence, health and safety.

According to the Ministry of Health in Saudi Arabia it is a state of stunted or incomplete mental development, and is characterized in particular by an impairment of skills, and appears during the course of development, and affects the general level of intelligence, i.e. cognitive, linguistic, motor, and social abilities, and retardation may occur with or without another psychological or physical disorder.

The most famous of these is Down syndrome, which is a congenital disorder resulting from the presence of an extra chromosome in the cells of the body, and the percentage increases with increasing the age of the mother(Health of Ministry, 2020).

2. **Visual disability**: It is represented in the loss of vision, either completely (blindness) or partially (visual impairment), as it leads to limiting the individual's ability to receive information and obtain knowledge and learning processes, in addition to practicing activities of daily life.

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3. **Hearing disability:** It is represented in the loss of hearing either completely (deafness) or partially (hearing impairment), as this loss leads to a limitation of the individual's ability to communicate with others.
4. **Physical disability:** It is represented in various types of disability, or severe or chronic physical injuries to the central nervous system, bones, or muscles, which lead to deficiencies in physical and motor activity.
5. **Multiple disabilities**: where the individual suffers from more than one type of disability at the same time.
6. **Linguistic disability**: It is a disability that is a deviation in the development of assimilation or use of spoken or written language, or any other symbols.

Difficulties Facing Students with Disabilities

The difficulties or problems faced by persons and students with disabilities differ according to the type of disability they suffer from, and according to their role or position in society, and these difficulties are represented by the following(Al-Mukainen, Al-Abdullah& Al-Najadat, 2014):

1. **Developmental difficulties**: They focus on the basic psychological processes that students with disabilities need, which is learning processes that focus on attention, memory, perception, thinking, and language.
2. **Social difficulties**: It represented in the difficulty of assuming personal or social responsibility, the difficulty in controlling their inappropriate actions towards others, and social withdrawal, as they are characterized by laziness and lack of social contact with others.
3. **Psychological disorders:** These disorders include severe or minor depression, chronic or temporary, and bipolar disorder, which is characterized by alternating periods of high mania and energy, irritability or depression, in addition to anxiety disorders.

Based on the difficulties facing students with disabilities mentioned above, the most social problem facing students with disabilities is the negative view of society for this group of individuals, and that they should be isolated in their own environments away from the normal life of individuals in society. This contributed to the increase in bullying on them, but at the present time, the society's perception of this group varied, as they were gradually incorporated into societies, and they started to lead a normal life (Gobalakrishnan, 2013).

On the other hand, the health condition and the endurance of individuals with disabilities have a significant impact on the quality of their lives, their ability to participate in social activities and activities and confront the cases of bullying they are exposed to.Some researches indicated that most individuals with disabilities can carry out self-care activities, such as taking off and getting dressed, eating, getting in and out of bed, they can also take a bath independently (Beech, 2010).

Individuals with disabilities can also face conditions related to the environment surrounding them, and the conditions of the country in which they live, where students with disabilities do not receive services and assistance from the community and local institutions due to the country’s conditions, which are represented in poverty, poor infrastructure, lack of resources, and therefore lack services such as health, education, and others in such societies (Beech, 2010).

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III. The Problem of Research

The topic of students with intellectual disabilities received the attention of educational scientists, psychology and education as it contributes to providing a set of educational, psychological, social and professional services.These services work to upgrade these aspects of them, and contribute to reducing and mitigating their cases of bullying through educational, behavioral and psychological programs.

These programs in turn will contribute to providing students with intellectual disabilities with knowledge, attitudes, values and skills that enable them to integrate into the activities of social life and face various difficulties in light of the increasing rates of intellectual disabilities in different parts of the world, whether from developed or developing societies. At the global level, the World Health Organization's indicators refer that there are around the world estimate more than 1,000 million students with disabilities and they make up almost 15% of the world's population (i.e. a disabled person out of every 7 students) (Stacey, 2014).

Studies and statistics conducted in the United States of America also indicated that (1,600,000) students escape the pain of bullying they are subjected to from their colleagues. Moreover, a third of the students in these schools are between the ages of (11-18) years, and they faced forms of bullying inside the school. Consequently, bullying poses a destructive threat to students, whether they are ordinary or suffer from intellectual disabilities.

Hence, bullying has negative effects and contributes to low emotionalism and a sense of reassurance. Victims of bullying suffer from loneliness, social harmony, lack of social relations, social withdrawal, loss of psychological security, and low Self- concept and low sense of belonging to the group (Hillsberg & Spak, 2006).

The results of many previous studies in this field indicate the importance of identifying the problems that most affect bullying on students with intellectual disabilities, and from this side Othman (2018) study found that the prevalence of school bullying among intellectually disabled children was relatively high, while Al-chalach(2019) study assured the need to reduce bullying, using various programs and strategies. In the same context, the results of the study Hadiya, Al-Behairi& Abdel-Latif (2016) indicated a decrease in bullying cases among those who have visual impairments after applying the counseling program.

In the same context, the researcher has extrapolated previous studies and theoretical literature related to the subject of the study. The researcher noted the prevalence of violence and aggression behavior and bullying behavior among students, clearly until it became part of their lives. However, he found a clear lack of Arab studies that dealt with the importance of identifying the problems most affecting in Bullying on a sample of students with intellectual disabilities in the Kingdom of Saudi Arabia, so it was necessary to conduct this study. From all the above justifications and recommendations of the aforementioned studies, the problem of the current study can be determined in the following main question:

IV. Research Question

Does each of the variables "error in diagnosis, electronic games, bullying inside school, neglect of parents, neglect of peers, school neglect, electronic bullying and family violence" have a significant psychological impact on

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bullying on students with intellectual disabilities from the perspective of parents in the Kingdom of Saudi Arabia?

V. RESEARCH OBJECTIVES

Identifying the moral impact of each of the research variables represented by error in diagnosis, electronic games, bullying inside the school, neglect of parents, neglect of peer, school neglect, electronic bullying and family violence, according to their importance in increasing the phenomenon of bullying on students with intellectual disabilities from the perspective of parents in the Kingdom of Saudi Arabia.

VI. IMPORTANCE OF RESEARCH

1. Discussing the theoretical and practical importance of logistic regression technique in the analysis given the nature of the collection, all of which are Binary type.
2. What distinguishes the current research is the focus on the use of the logistic regression model in some applications and issues related to the phenomenon of bullying on students with intellectual disabilities.
3. Contribution of the results of the research to determining the most important factors affecting the increase in bullying phenomenon for students with intellectual disabilities.
4. This research may add solutions to some problems related to bullying for students with intellectual disabilities, and it may help those interested and researchers find the factors that influence the increase of this phenomenon.
5. The present study derives its theoretical importance from its treatment of a problem with a degree of seriousness which is “bullying”, where studies have shown the negative impact of this problem on the psychological, emotional and mental aspects of both bullies and victims, and even on society at large.
6. The general orientation of the study in terms of caring for students with intellectual disabilities, as they need special programs and methods for raising and educating them.

VII. RESEARCH DELIMITATION

1. **Place:** Asir region in the Kingdom of Saudi Arabia.
2. **Time:** 2020.
3. **Sample:** parents of primary and middle school students.

The results of the current research were limited to identifying the most important factors affecting increased bullying on students with intellectual disabilities, which are the error in diagnosis, electronic games, bullying inside the school, neglect of the parents, neglect of peer, school neglect, electronic bullying and family violence.

VIII. RESEARCH TERMS AND PROCEDURAL DEFINITIONS

8.1 LOGISTICS REGRESSION MODEL: Stéphane defines it as a kind of regression where the dependent variable can take two values (binary logistic regression) and may take more than two peaks (multiple logistic regression).

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However, in logistic regression our objective is not to explain the change in the values of the dependent variable, but it is the interpretation of the probability of occurrence and non-occurrence of the phenomenon under study (Stacey, 2014).

The researcher defines it procedurally as an appropriate statistical method for the current research that helps him determine the most important factors affecting the increase in the phenomenon of bullying on students with intellectual disabilities from the parents' perspective.

8.2 BULLYING: Horwood, Waylen, Herrick, Williams & Wolke defined it as: "A behavior that occurs when a student is subjected to repeated exposure to aggressive behaviors or practices by other students, with the intention of harming him, and it is usually an imbalance of strength, which is either as physical as beating, verbally like calling for titles, or emotionally, such as provoking feelings, social ostracism, or abuse"(Horwood, Waylen, Herrick, Williams & Wolke, 2005).

Procedurally, the researcher defines it as a form of widespread violence to which the intellectually disabled are exposed, and the intended behavior means harm or inconvenience on the part of one or more individuals.

8.3 INTELLECTUAL DISABILITY: He is the individual whose disability hinders him from pursuing learning and training except according to special methods, and it is everyone who cannot communicate with his peers by writing, i.e. he cannot express his thoughts in writing and does not read or understand what he reads normally while he has no visual disturbance or Kinetic paralysis explains this (Ismail & Farah, 2016).

The researcher defines it procedurally as the phenomenon that primary and middle school students with intellectual disabilities suffer from.

IX. RELATED STUDIES

Al-chalach (2019) conducted a study entitled: The effectiveness of a behavioral cognitive program in developing the concept of self and its effect on reducing bullying behavior among a sample of high school students. International Specialized Journal. It aimed to reveal the effectiveness of a behavioral cognitive program in developing the concept of self and its effect on reducing bullying behavior among a sample of third-grade students at Prince Saud Al-Faisal Secondary School in Riyadh, Saudi Arabia for the academic year (1439-1440 H. The researcher followed the semi-experimental approach. The sample of the study was composed of (50) students from the secondary stage and to reach the goals of the study, the researcher applied a scale of self- concept, bullying scale, and a behavioral knowledge program in developing the concept of self and reducing bullying behavior (prepared by the researcher), and the scales were applied before and after applying the program. Then, the data was collected and the needed statistical analysis was conducted. And there were statistically significant differences at the significance level (0.01) between the mean scores of students of the experimental group in the pre and post application of the scale of the self -concept in favor of the post application, and the presence of statistically significant differences at the level of significance (0.01) between the mean scores of the experimental group in the pre and post application of the Bullying scale in favor of post application. The results also revealed the impact of the behavioral cognitive

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program that lasted for two months in developing the self-concept and reducing bullying behavior among students, as this was shown in the follow-up measurement, and in light of the results a set of recommendations and proposals were presented to reduce the phenomenon of bullying using various programs and strategies.

And in a study by **Othman** (2018) entitled: School bullying among a sample of intellectually disabled children who are able to learn and the effectiveness of a behavioral counseling program in reducing it. This study aimed to identify the prevalence of school bullying among a sample of intellectually disabled children who are able to learn, and the differences between them according to the gender variable, and the effectiveness of a behavioral counseling program in reducing it. The semi-experimental study sample consisted of (10) male children with an average age of (10.6), and a standard deviation of (1.019). They were divided into two groups, the instructional group, which consisted of (5) children, and the control group, which consisted of (5) children. They were selected from among the core sample, which consisted of (90) children, by obtaining the highest scores on the school bullying scale. The study used the school bullying scale (prepared by the researcher), and a behavioral counseling program (prepared by the researcher), and the study results revealed that school bullying among intellectually disabled children is relatively high, and that there are no statistically significant differences between the mean scores of males and the mean scores of female grades on School bullying scale, and that there is an effectiveness of the behavioral counseling program in reducing school bullying among study sample individuals, and its continued effectiveness after the follow-up period.

Hadiya, Al-Buhairi and Abdul Latif(2016) also conducted a study about "The effectiveness of a counseling program to reduce bullying in a sample of deaf teenagers". The study aimed to prepare a counseling program to reduce bullying in a sample of deaf teenagers. To achieve the goal of the study, the experimental method was used, and the exploratory sample consisted of 15 teenagers and their ages ranged between (13-15 years); with an average age of 13.933 years and a standard deviation of 0.884 of deaf teenagers, and their IQ ranged between 90-110 degrees according to Assiut University scale for non-verbal intelligence. This sample was used to prepare a scale of bullying for them, and the basic study sample consisted of 15 teenagers, their ages ranged between 13-15 years with an average age of 14.333, a standard deviation of 0.724 deaf teenagers and their IQ ranges between 90-110 degrees according to Assiut University scale of non-verbal intelligence with average IQ of 104.853 and a standard deviation of 5,659 from government schools (Al-Amal School for the Deaf and Dumb in Mansoura). The study instruments consisted of: a questionnaire and school files, Assiut University scale for nonverbal intelligence, socioeconomic level scale, illustrated bullying scale for deaf teenagers, bullying scale for deaf teenagers, and counseling program to reduce bullying for deaf teenagers. The results revealed that there were statistically significant differences between the mean scores of the experimental and control groups 'grades on the bullying scale for deaf teenagers, in favor of the control group. There are also statistically significant differences among the mean scores of bullying grades of the experimental group of deaf teenagers in the two scales before and after the application of the counseling program procedures, in favor of the pre-measurement. The results also showed that there were no statistically significant differences between the mean scores of bullying of the control group of deaf teenagers in the two measurements before and after the application of the counseling program. There were no statistically significant differences

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between the mean scores of the experimental group grades of deaf teenagers in the measurement after applying the counseling program and tracking measures.

Kowalski, Morgan, Drake-Lavelle, & Allison (2016). "Cyberbullying among college students with disabilities". Cyberbullying has received increasing attention in recent years. However, the majority of this research has focused on children in middle school and on neurotypical youth, to the omission of students with disabilities. The current study, however, examines cyberbullying as it occurs among college students with and without disabilities. Two hundred five students completed a survey examining their experiences with cyberbullying, along with measures of predictor and outcome variables theorized to be related to cyberbullying. The results revealed that, as with traditional bullying, students with disabilities are at particular risk for cyberbullying victimization. Predictors of victimization included traditional bullying victimization, Internet use, and the notice ability of the disability. Outcomes of cyberbullying victimization (e.g., low self-esteem, high depression) appear to be particularly pronounced for individuals with disabilities.

In a study conducted by **Al-Dahan** (2015) entitled: Bullying behavior of a disabled child (intellectually - acoustically) and its relationship to the variables of self-consideration and self-defense and the identification of facial emotions, the aim of the study was to reveal the relationship between the behavior of the bully (the bully - the victim) and both of the self-consideration Self-defense and recognition of facial emotions. A sample of 20 intellectually disabled children from 10-17 years old, and 20 hearing impaired children ages 8-17 were used. Bullying scale, bullying victims scale, self-esteem scale, self-defense scale, and facial emotion recognition scale were applied. The most important results indicated the following: It is clear that there is a partial correlation between the behavior of bullying (the victim) and the study variables, and that there is a correlation between both the variable of self-esteem and self-defense for both intellectually disabled children and children with hearing impairment. The results also indicated that intellectually disabled children have difficulty in identifying facial reactions and this may be due to insufficient mental and cognitive functions they have. The results also indicate that the identification of facial emotions, with all the variables of the study, depends on reading lip language which may be due to the learning strategies of hearing-impaired children, which helps focus on facial emotions well.

Ferguson, Olson, Kutner & Warner (2014) Violent video games, catharsis seeking, bullying, and delinquency: A multivariate analysis of effects. The effects of violent video game exposure on youth aggression remain an issue of significant controversy and debate. It is not yet clear whether violent video games uniquely contribute to long-term youth aggression or whether any relationship is better explained through third variables such as aggressive personality or family environment. The current study examines the influence of violent video game exposure on delinquency and bullying behavior in 1,254 seventh and eighth-grade students. Variables such as parental involvement, trait aggression, stress, participation in extracurricular activities, and family/peer support were also considered. Results indicated that delinquent and bullying behavior were predicted by the child's trait aggression and stress level. Violent video game exposure was not found to be predictive of delinquency or bullying, nor was level of parental involvement. These results question the commonly held belief that violent video games are related to youth delinquency and bullying.

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Yang(2012) Paths to bullying in online gaming: The effects of gender, preference for playing violent games, hostility, and aggressive behavior on bullying. This study examined a sample of adolescent online game players and explored the relationships between their gender, preference for video games (VG), hostility, aggressive behavior, experiences of cyberbullying, and victimization. The path relationships among the variables were further validated with structure equation modeling. Among the respondents, 1,069 (86.77%) had played online games and these respondents were the subjects of this study. The analyses revealed a significant relationship among preference for VG, hostility, aggressive behavior, and cyberbullying among online gamers. Preferences for VG were indirectly associated with cyberbullying via aggressive behavior. Moreover, the tendency toward hostility was indirectly associated with cyberbullying via victimization. Being a victim of cyberbullying was directly associated with both cyberbullying and aggressive behavior and indirectly associated with cyberbullying via aggressive behaviors.

Conners- Burrow, Johnson, Whiteside-Mansell, McKelvey, &Gargus (2009) Adults matter: Protecting children from the negative impacts of bullying. This study examines to identify the degree to which support from parents and teachers buffers the level of depression for four groups of children involved in bullying (victim, bully, bully- victims, or not involved children). Nine hundred and seventy- seven 5th- , 9th- , and 11th- grade students in the rural South completed questionnaires on bullying, social support, and depression. Children who were not involved in bullying reported less depression and more social support than children involved in bullying, and bully- victims were the most at- risk group. Furthermore, results indicate that in all four bully status groups, children reported fewer symptoms of depression when support from parents was high compared to when it was low. For all groups except victims, when parental support was low, support from teachers was associated with fewer symptoms of depression. When parental support was high, the impact of support from the teacher was not significant.

Konishi, Hymel, Zumbo, Li, Taki, Slee, & Kwak(2009) Investigating the comparability of a self-report measure of childhood bullying across countries. Responding to international concerns regarding childhood bullying and a need to identify a common bullying measure, this study examines the omparability of children's self-reports of bullying across five countries. The Pacific-Rim Bullying Measure, a self-report measure of students' experiences with six different types of bullying behavior and victimization, was administered to 1,398 grade 5 students from Australia, Canada, Japan, Korea, and United States. Multigroup confirmatory factor analysis and item response theory modeling was used to evaluate construct equivalence on the measure across different countries. Preliminary results revealed some construct differences across countries, that is, the bullying measure is measuring one construct, but that the construct is manifested differently in the different countries.

X. THE FIELD STUDY

10.1 Research Procedures and Methodology

The researcher used the analytical descriptive method by taking note of the literature of the subject and studying the concept of multi-binary logistic regression.

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10.2 The Research Sample

The sample of the study consisted of (72) parents of primary and middle school students who suffer from intellectual disabilities in the Asir region, who were chosen in a simple random way.

10.3 Instrument

A questionnaire was developed that identifies the factors that influence the increase in bullying phenomenon for students with intellectual disabilities, which consists of nine elements, all of which are of a binary type due to the ease of answering, collecting data and shortening time, which are as follows:

1. **Variable dependent:** Are the students with intellectual disability subject to more bullying due to their disability?

(face problems, do not face problems)

2. **Independent Variables (Explanatory Variables)**

Q1) Does a mistake in diagnosing a state of intellectual disability increases the incidence of bullying of persons with intellectual disabilities?(Yes, No)

Q2) Do peer-to-play electronic games play a role in increasing bullying cases of persons with intellectual disabilities? (Yes No)

Q3) Are the persons with intellectual disabilities exposed to bullying cases inside the school? (Yes No)

Q4) Does the neglect of parents of the persons with intellectual disabilities increase bullying cases? (Yes No)

Q5) Does peer neglect of the intellectual disabled cause an increase in bullying? (Yes No)

Q6) Does the school's neglect of the intellectual disabled cause an increase in bullying cases? (Yes No)

Q7) Is the intellectual disabled exposed to electronic bullying cases? (Yes No)

Q8) Do cases of domestic violence increase the incidence of bullying of persons with intellectual disabilities? (Yes No)

10.4 Research procedures

1. After reviewing the different theoretical aspects of theoretical literature, previous studies of logistic analysis.
2. The characteristics of the research population were examined and the sample was selected in a simple random way according to these characteristics.
3. Application of the research tool to the sample members, then the answers were unloaded and processed by the necessary statistical analysis using SPSS program.
4. Extracting and discussing results, then classifying them according to the objectives of the study.

10.5 Statistical Treatments and Statistical Programs Used in Research

The SPSS version (25) program was used for statistical analysis, where Multi-Logistic Regression Binary Response.

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1. Maximum de vraisemblance: to find the appropriate equations, and then we solve these equations numerically through repetitive methods (Ahmed, 2009).
2. Wald test: To illustrate the importance of logistic regression coefficients by comparing the probability values of the Wald statistic with the previously determined level of significance by the researcher to determine whether the variable in question is statistically significant or not, to determine the statistical significance of each variable separately.
3. Hosmar and Lemshow: to see if the model represents the best representation data. In this test, we use the same principle in the case of normal regression. This is the comparison of the expected values in the case of the model without independent variables with the expected values in the form containing the independent variables.

XI. Results and Discussion

11.1 The First Question

Does each of the variables "error in diagnosis, electronic games, bullying inside school, neglect of parents, neglect of peers, school neglect, electronic bullying and family violence" have a significant psychological impact on bullying on students with intellectual disabilities from the perspective of parents in the Kingdom of Saudi Arabia?

To answer this question, the ready-made SPSS package was used, and the Enter method was used. The descriptive information for the sample that was found is in the following table:

Table 1: Case Processing Summary

Unweighted Cases(a)		**N**	**Percent**
Selected Cases	Included in Analysis	72	100.0
	Missing Cases	0	0.0
	Total	72	100.0
Unselected Cases		0	0.0
Total		72	100.0

a If weight is in effect, see classification table for the total number of cases.

Table (1) summarizes the data entered in the analysis, the size of the studied sample, and missing data. The following table (2) represents the code or the values of the dependent variable.

Table 2: Dependent Variable Encoding

Intellectually disabled being bullied	**Internal Value**
Yes	0
No	1

In order to calculate the number of repetitive cycles of the derivatives of the maximum potential function to obtain the lowest negative value for the two functions of the maximum potential for obtaining the optimal estimation of the parameters of the model, the following table was created:

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Table 3: Iteration History (a, b, c, d)

Iteration		-2 Log likelihood	Constant	Coefficients							
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Step 1	1	110.84	2.30	-0.55	-0.55	-0.14	-0.35	0.60	0.44	1.53	1.61
	2	86.43	3.87	-0.16	-1.04	-0.42	-1.78	1.63	1.15	2.67	2.71
	3	76.36	5.07	1.03	-2.12	-0.79	-3.94	2.74	1.69	4.42	3.88
	4	73.04	6.06	2.23	-3.28	-0.93	-6.07	3.74	1.80	6.49	4.95
	5	71.89	7.06	3.28	-4.32	-0.95	-8.12	4.75	1.81	8.53	5.97
	6	71.47	8.06	4.30	-5.34	-0.95	-10.14	5.75	1.81	10.59	6.98
	7	71.32	9.06	5.30	-6.34	-0.95	-12.15	6.76	1.81	12.55	7.98
	8	71.26	10.06	6.30	-7.34	-0.95	-14.15	7.76	1.81	14.55	8.98
	9	71.24	11.06	7.30	-8.34	-0.95	-16.16	8.76	1.81	16.55	9.98
	10	71.24	12.06	8.30	-9.34	-0.95	-18.16	9.76	1.81	18.55	10.98
	11	71.23	13.06	9.30	-10.34	-0.95	-20.16	10.76	1.81	20.55	11.98
	12	71.23	14.06	10.30	-11.34	-0.95	-22.16	11.76	1.81	22.55	12.98
	13	71.23	15.06	11.30	-12.34	-0.95	-24.16	12.76	1.81	24.55	13.98
	14	**71.23**	**16.06**	**12.30**	**-13.34**	**-0.95**	**-26.16**	**13.76**	**1.81**	**26.55**	**14.98**
	15	**71.23**	**16.06**	**12.30**	**-13.34**	**-0.95**	**-26.16**	**13.76**	**1.81**	**26.55**	**14.98**

a Method: Enter

b Constant is included in the model.

c Initial -2 Log Likelihood: 229.457

d Estimation terminated at iteration number 15 because parameter estimates changed by less than 0.001.

The results in the previous table show the method of estimating the logistic regression model parameters in a repetitive way, i.e. the calculation is repeated until the values of the parameters converge at a given line and at the smallest value of the function of efficiency. In this table, we can observe the stability of the model parameters at step 5 where we observe that the values of the fourth step are equal to the values of step 15 at (0.001) approximation. In the fifteenth cycle of the negative variable we obtained the weakest possible function with the lowest value (229.45). So, (-2log likelihood=229.45), and we stopped at this cycle because the change in the coefficients became less than 0.001.

In fact, the change in the estimated parameters became very slow after the twelfth session, as we observe from Table (3). Therefore, it can be said that the parameters in cycles (13, 14 and 15) are very similar with very small differences; we stopped at the fifteenth session and considered them the best possible results for the parameters because the weakest probability of the maximum possible function is at its lower end at this cycle, this indicates that there is a relationship between the dependent variable, the disabled person is exposed to problems because of his disability, which increases the number of bullying cases and the variables that explained this variable.

The parameters of the optimal model obtained in the fifteenth cycle of Table (3) were also found. All the parameters of the estimated model (constant, b1..., b8) and standard error for each parameter are shown the following table:

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Table 4: Variables in the Equation

Independent variable		B	S.E.	Wald	dF	Sig.	Exp. (B)	95.0% C.I.forEXP(B)	
								Lower	Upper
Step 1[a]	Q1	-19.34	19965.76	0.004	1	0.999	0.000	0.000	0.231
	Q2	**0.95**	**0.59**	**2.573**	**1**	**0.019***	**2.598**	**0.809**	**8.344**
	Q3	**38.16**	**19067.07**	**1.200**	**1**	**0.028***	**4E+016**	**0.000**	**4E+076**
	Q4	-19.76	23972.56	0.031	1	0.999	0.000	0.000	1.348
	Q5	-1.81	23390.75	0.002	1	1.000	0.163	0.000	2.541
	Q6	-38.55	24807.68	0.001	1	0.999	0.000	0.000	2.432
	Q7	**-20.98**	**5249.41**	**0.387**	**1**	**0.047***	**2.670**	**0.000**	**1.463**
	Q8	**18.90**	**5249.41**	**0.132**	**1**	**0.007***	**2E+008**	**0.000**	**2E+432**
	constant	41.414	7310.16	0.148	1	0.995	1E+018		

a Variable(s) entered on step 1: Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8.

From Table (4), we observe that the attached model coefficients are in log-odd units. The equation of the model is as follows:

Log [pˆ/(1-pˆ)] = 41.414-19.349 X1+0.955 X2+38.160 X3-19.762 X4-1.817 X5-38.559 X6-20.984 X7+18.901 X8

pˆ:The ability to obtain an answer that the intellectually disabled does not encounter problems because of his disability increases the cases of bullying, and these estimates clarify the relationship between the independent variables and the dependent variable of the units (logit).

From the same Table we Find

The variable (Var3) was ranked first "the intellectually disabled faces bullying cases inside the school" in its influence on the dependent variable (Y) bullying phenomenon on students with intellectual disabilities, since the regression coefficient of this variable B3 = 38.16, that is, the change in (Var3) will increase the probability of decreasing the phenomenon of bullying on students with intellectual disabilities by (38.16) times in the preference logarithm of the dependent variable, with the stability of the effect of the rest of the variables. This parameter showed significance on the dependent variable at the significance level of 0.05 for the sake of dF=1, where the value of Sig = 0.028, and the value of Wald statistic = 1.200, and the value of Exp (B) = 4E + 016, that is, the possibility or opportunity to display the intellectually disabled exposing to cases of bullying inside the school and its effect on increasing the phenomenon of bullying on the intellectually disabled is (4E+016) times greater than the possibility of not being bullied.

This is explained by the fact that school bullying or bullying in the study places is the most prevalent type of bullying, through the intellectually disabled being exposed to physical or psychological abuse through hitting, kicking, pulling hair, vandalism of the person's property, negative imitation, defamation, insults, rumors, threats, insulation, underestimating him.

Bullying reflects negatively on students with intellectual disabilities to find them living in a state of anxiety, fear, isolation and loneliness that may reach advanced stages of depression. Hence, the role of parents in preventing

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school bullying must be activated through continuous work with the school to develop an effective plan to limit the behavior of the bully student and to identify the child's behavioral problems if any, and to control the student's view of violent television programs or in which he sees, for example, students who fall on the floor and being mocked and laughed at by others. The school must also enact strict laws prohibiting any student from harming the other, whether it is physical or psychological to create a safe and quiet environment for all students.

This result is consistent with the study of (Al-chalach, 2019) and (Othman, 2018) study, in terms of school bullying cases of disabled students and their treatment through counseling programs.

While variable (Var7) was ranked in the second place "exposure to cases of electronic bullying? (Yes, No)" in influencing the dependent variable (Y) bullying phenomenon on students with intellectual disabilities, as the regression coefficient of this variable B7 = -20.984, that is, the change in (Var7 will reduce the probability of not increasing the phenomenon of bullying on students with intellectual disabilities by (-20.98) times in the logarithm of the preference of the dependent variable with the stability of the effect of the rest of the variables, and that this parameter showed significance on the dependent variable at the significance level of 0.05 for dF=1 where the value of Sig = 0.047, and the value of Wald statistic = 0.387, and the value of Exp (B) = 2.67, meaning that the possibility or opportunity of electronic bullying increases the number of cases bullying on the intellectually disabled and their impact on the increase in the phenomenon of bullying intellectually disabled larger by (2.670) times than the possibility of not being subjected to bullying situations.

This explains the seriousness of electronic bullying that parents perceive and that their intellectual disabled children are exposed to, and that they exceeded the danger of traditional bullying because electronic bullying is unknown to the victim in addition to the fact that the material of bullying is sometimes found on the information network, and the most dangerous thing is that this article spreads widely and has no spatial or temporal boundaries.

This finding was consistent with the study of (Kowalski, Morgan, Drake-Lavelle, & Allison, 2016) that examined the role of electronic bullying and its impact on victims who are exposed to it.

In the third place, the variable (Var8) "the role of family violence in increasing cases of bullying on the intellectually disabled" in influencing the dependent variable (Y) the phenomenon of bullying on students with intellectual disabilities, as the regression coefficient of this variable B8 = 18.901, that is, the change in (Var8) will increase the probability of not increasing the phenomenon of bullying on students with intellectual disabilities by (18.90) times in the preference logarithm of the dependent variable with the stability of the effect of the rest of the variables, and that this parameter showed significance on the dependent variable at the significance level of 0.05 for dF=1 where the value of Sig=0.007, and the value of Wald statistic=0.132, and the value of Exp(B)=2E+008, meaning that the possibility or opportunity for the role of family violence in increasing bullying cases of the intellectual disabled is (2E+008) times greater than the possibility of not being bullied.

This is explained by the fact that family violence plays a major role in the causes of bullying among children, as they are accustomed to seeing this behavior in the family, such as cruelty, hostility and fierce treatment among members of his family, making him know only this method in order to obtain the attention and respect of others, so

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he practices it in his relationship with his peers, and he does not distinguish whether they are healthy or handicapped, as the behavior in his view is either to be an aggressor to be empowered and get what he wants or to be humiliated so he is an outcast, and he will surely take the path of aggression and bullying.

This finding was consistent with the study of (Conners - Burrow, Johnson, Whiteside - Mansell, McKelvey, & Gargus 2009) that demonstrated the importance of supporting families to confront bullying cases and to be of assistance to them.

In the fourth and last rank, the variable (Var2) "the role of electronic games practiced by the peer" in affecting the dependent variable (Y) bullying phenomenon on students with intellectual disabilities, as the regression coefficient of this variable B2 = 0.955, that is, the change in (Var2) will increase the probability of not to increase the phenomenon of bullying on students with intellectual disabilities by (0.955) times in the priority algorithm of the dependent variable with the stability of the effect of the rest of the variables, and that this parameter showed significance on the dependent variable at the significance level of 0.05 for dF=1 where the value of Sig = 0.019, and the value of Wald statistic = 0.004, and the value of Exp (B) = 2.598, meaning that the possibility or opportunity for the role of electronic games Peer practicing is (2.598) times greater than the possibility of not being bullied.

This explains that the frequent use of electronic games can lead to bullying, which clearly affects children. Among these electronic games are violent games, some films inciting violence, as well as violent cartoon films and free wrestling programs, which make violence and abuse fun enjoyable, and even a way Life. Therefore, parents must sit with the children during play, in addition to specifying the length of time that children spend on these electronic games.

The results of this research were consistent with the study of (Yang, 2012) and (Ferguson, Olson, Kutner & Warner, 2014) study which showed that violent films and electronic games that encourage violence and make it an entertaining material, influence the behavior of students and increase bullying cases in addition to a study

As for the test of the adequacy of the whole model and the quality of fit in linear regression, in the case of the logistic model we used F and R2 in the linear regression. In the case of the logistic model, the log likelihood ratio which follows the distribution of Chi -Square-X^2 according to the relationship:

$X^2 = 2 (Log_e L_0 – Log_e L_1)$

L_1: The maximum possible function value that contains (i) variable.

L_0: The maximum possible function value that contains (i-1) variable.

Table (5) clarifies how to calculate the value of X^2:

Table 5: Omnibus Tests of Model Coefficients

Model	Chi-square	df	Sig.
	158.22	8	0.000

From Table (5) we find the value of (X2 =158.22), with a probability value (0.00) which is a statistically significant. By calculating the value of X2, Contingency Table was calculated as shown in Table (6)

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Table 6: Contingency Table for Hosmer and Leme show Test

Step 1	Intellectually disabled being bullied				Total Observed
	Yes		No		
	Observed	Expected	Observed	Expected	
1	16	16.000	0	0.000	10
2	8	8.000	0	0.000	4
3	24	28.173	8	3.827	14
4	16	11.827	0	4.173	7
5	8	8.000	16	16.000	11
6	0	0.000	16	16.000	7
7	0	0.000	24	24.000	9
8	0	0.000	16	16.000	6
9	0	0.000	16	16.000	4

From the intersection of totals of the binary dependent variable (Y) with totals of estimated probabilities, the cross-table of the dependent variable totals was created with totals of the estimated probabilities through the Hosmer statistic, which follows the distribution of Kai squares to test the significance of the differences between observed and Expected as shown in Table (7):

Table 7: Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.816	7	0.147

From the previous table, the value of H-Statistic=10.816 with a probability value of (0.147) indicates the quality of the whole model, so that the model fits the data well, which indicates the existence of a general indication of the parameters of the model, which confirms the results in the previous table (6).

The role of problems that the intellectually disabled person is exposed to due to his disability increases the cases of bullying, and their repercussions on them, as the values were very close to the actual and predicted values in the case of influence or not.

To find out the percentage of the resulting model in the current study of the study data, we found the following table:

Table 8: Classification Table (a)

Observed			Predicted		
			Intellectually disabled being bullied		Total summation
			No	Yes	
Step 1	Intellectually disabled being bullied	No	29	4	32
		Yes	4	37	40
	Overall Percentage		0.917		72

a .The cut value is.500

From the previous table, we find (Overall Percentage= 0.917), i.e. only 14 views were wrongly categorized, and the overall error probability (9.17%) is good, indicating that the model represents the data well.

From the results of the research, it was found that half of the independent variables had a clear and important impact in increasing bullying on the students with intellectual disabilities, as the variable of students with intellectual disability exposure of cases of bullying inside the school came in the first place and in the second place

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electronic bullying and the third place the role of family violence and in the fourth and last place the role of electronic games practiced by peers in the increase of bullying cases of persons with intellectual disabilities had an effect on the dependent variable.

Regarding the remaining variables (Var6, Var5, Var4, Var1), which are respectively the error in diagnosing the state of intellectual disability, parental neglect, peer neglect, school neglect for the intellectually handicapped, an increase in cases of bullying, they had no effect and importance on the dependent variable as the rest previous variables, with large values on the dependent variable at the significance level 0.05 at dF=1 where their values are respectively (0.999, 0.999, 1.000, 0.999).

XII. RECOMMENDATIONS AND PROPOSALS

From the results of this research and the previous studies reviewed in this research, the research reached some recommendations and suggestions:

1. Using logistic regression models to study and explain other social phenomena that students with intellectual disabilities suffer from.
2. The use of other binary models of regression in future studies related to the phenomenon of bullying.
3. Conducting studies focusing on linking bullying and the stereotypical image of the intellectually disabled within Arab societies.
4. Generalizing the idea of using the logistical model in the social, economic, educational and bullying phenomena, and not focusing on the medical fields only as it was previously.
5. Paying attention to the relevant models in studying qualitative variables and making use of the standard economics of qualitative variables, and then applying them in the areas of intellectual disability and revealing the aspects affecting them.
6. Building models that take into consideration the interaction between the explanatory variables of bullying and the role of society in reducing it.

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