Multiplicative regression for education level, dysfunctional parenting, and gratitude parents of special needs children



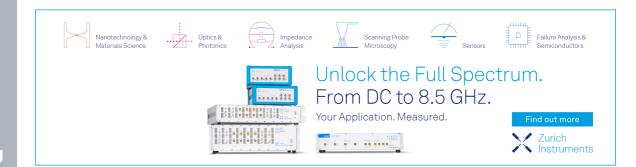
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Multiplicative Regression for Education Level, Dysfunctional Parenting, and Gratitude Parents of Special Needs Children

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Abstract. Education for children with special needs is not easy to carry out, especially in the pandemic COVID-19. All activities are centered at home. The parenting process is carried out entirely by parents. This study investigates how dysfunctional parenting which happens in special children can be reduced if parents increase gratitude. This study uses a quantitative approach with multiplicative regression data analysis techniques because the moderator variable is a stratified categorical variable. The level of a parent's education is a moderating variable to determine whether it has a positive role in reducing dysfunctional parenting or not. Subjects are 61 parents who have special children. Data were collected using a Parenting Scale consisting of 30 items, a gratitude scale consisting of 36 items, and the level of parental education. The results showed that the more grateful parents were, the lower the dysfunctional parenting. In addition, the level of education also increases the causal relationship, although it does not have a significant effect. This can be seen from the increase in r-square with the inclusion of the moderator variable education level.

INTRODUCTION

Children with special needs are different from children in general in their mental, emotional, or physical disabilities [1]. Hallahan and Kauffman (2006) define Children with special needs as children who need special education and services to develop all their potential [2]. The Ministry of Women's Empowerment and Child Protection of the Republic of Indonesia in 2015 recorded that there are at least 12 types of special needs children, including children with physical disabilities such as blind, deaf, and speech impaired, children with attention disorders, children with social behaviour disorders (ADHD and Autism), and children with the potential for intelligence or special talents (gifted).

Raising a child with special needs is not easy. The success of their growth and development is very dependent on education and attention given by parents and the environment acceptance [1]. However, there are still many parents who do not understand the conditions and needs of their children. The presence of children even becomes a burden for parents who have children with special needs. Often these children experience neglect and even exile. Even a lot of bad treatment of children with special needs is obtained from parents and the environment.

The acceptance, sincerity, and gratitude of parents for the presence of children with special needs in their lives, also affect the quality of parenting. According to Ross (1969) in his famous theory, the Kubler-Ross Grief Cycle, there are 5 stages that parents go through to accept children with special needs those are denial, anger, depression, bargaining, and acceptance [3]. So it is not an easy journey for parents to accept their child with special needs. Mortazavi et al, (2020) said, the stages of parental acceptance of children with special needs, known as the Kubler-Ross change curve can be seen in Figure 1 [4].

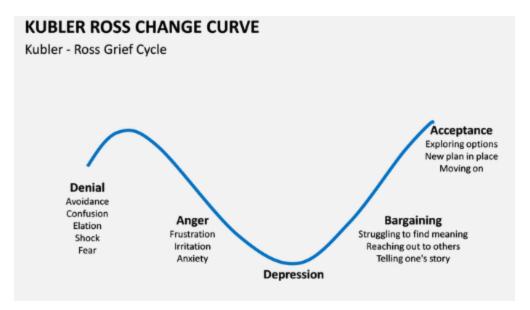


FIGURE 1. Stages of parental acceptance of children with special needs

According to Wijaya (2015), in addition to the parental misunderstanding of children, the lack of parental knowledge about positive parenting also exacerbates the dysfunctional parenting of special needs children [5]. There are still many inaccuracies in parental care caused by various factors such as the results of Anggraini's research [6]. Anggraini found that dysfunctional parenting is caused by several things, including parents' disappointment with their child's condition, parents feeling guilty and less careful when pregnant, parents also feeling responsible for their child's condition, and parents being embarrassed by the presence of their child.

The presence of gratitude in the care of children with special needs is also an important aspect of avoiding dysfunctional parenting. Parenting for children with special needs must be based on gratitude and positive treatment. If parental gratitude is low, it often causes stress and anxiety disorders [7]. This has an impact on the psychology of parents which has an impact on dysfunctional parenting patterns [8]. According to Meiza et al (2018), parents who experience anxiety, about their parenting cannot function optimally [7]. Parents always have concerns about what will happen to their children so they often act to spoil their children which can make discipline enforcement weak. This is one of the dysfunctional aspects of parenting. The amount of psychoeducation carried out in the field related to positive parenting is expected to reduce dysfunctional parenting if parents are grateful for the existence of their children with special needs.

Another variable that is also involved in this study is the level of education of parents. This variable will act as a moderator variable. According to Gaziano, different people in education often also differ in their knowledge of various things, for example capturing information related to health and various other topics [9]. More educated people may have better cognitive skills and may benefit more from exposure to information.

In this study, we will look at the role of the education level of parents of children with special needs in moderating the role of gratitude in reducing dysfunctional parenting. It is suspected that the level of education will increase the gratitude of parents, thereby reducing dysfunctional parenting.

METHODOLOGY

This study is a quantitative causality study. The following are operational research variables.

TABLE 1. Conceptual and Operational Variables

| Variables | Instruments and number of items | Measuring Scale |
|---|---------------------------------|-----------------|
| Dependent(Y): | Dysfunctional Parenting Scale, | Interval |
| dysfunctional parenting | Arnold et al (30 items) | |
| Independent (X1): | Islamic Gratitude Scale, | Interval |
| Gratitude | Meiza, et al (36 items) | |
| Mediator (X2): | Subjects demographic | Ordinal |
| The education level of parents of children with special needs | _ | |

Research Subjects

The research subjects were 61 parents who had children with special needs. They have a variety of education, ranging from elementary to postgraduate. Other data that was also collected were the age of children with special needs, the number of children, and solidarity with their partners in educating children.

Data Collection Technique

The research data were collected using a questionnaire consisting of two scales, namely the Dysfunctional Parenting Scale and the Gratitude Scale.

Research Instruments

The first data collection instrument is the Parenting Dysfunctional Scale which uses a choice of scores from 1 to 7, where 1 indicates high dysfunctional parenting and 7 indicates low dysfunctional parenting. The second measuring tool is the Islamic Gratitude Scale which uses options 1 to 4, ranging from Strongly Not Appropriate (SNA), Not Appropriate (NA), Appropriate (A), and Very Appropriate (VA). The choice of a very appropriate situation means that the subject is most grateful.

Dysfunctional Parenting Scale

The Dysfunctional Parenting Scale was developed by Arnold, et al (1993) [10]. This scale consists of 30 items which are divided into 3 aspects, namely laxness or weak discipline, over-reactivity (too reactive), and verbosity (talking a lot). Some items are in a positive context (16 items) and some are in a negative context (14 items). After the trial process and through instrument analysis, 24 valid items were obtained.

Gratitude Scale

This scale was compiled by Meiza, et al (2018) based on the concept of gratitude in Islam presented by Al Ghazali [7]. Gratitude on this scale is measured from 3 aspects, namely verbal gratitude, gratitude in action, and gratitude in the heart. At the beginning of the design, this measuring instrument has 50 items with a choice of a scale of 1 to 5. After going through the trial phase, the measuring instrument becomes 36 items consisting of 23 positive items and 13 negative items. Response options were changed from 1 to 4, to avoid central tendency.

Instrument Analysis

The reliability test of both scales uses Cronbach's Alpha. The reliability coefficient of the Dysfunctional Parenting Scale is 0.774 where there are 6 invalid items. Therefore, the Dysfunctional Parenting scale used to collect data consisted of 24 items. The Gratitude Scale reliability coefficient is 0.878. According to Fraenkel et al (2012), good psychometric properties are characterized by a reliability coefficient between 0.70 to 0.99 [11].

Data Analysis Technique

This research uses the multiplicative regression analysis. This regression technique is a special form of multiple regression because it involves mediator variables in the form of stratified categories (ordinal scale). Some people refer to this type of regression as the subgroup moderation method. Two regression models will be compared. The first model is a simple linear regression with Gratitude as the independent variable and Parenting dysfunction as the dependent variable. The second model is multiple regression with an additional independent variable, namely the education level of parents. The existence of this mediator variable is expected to change the functional relationship between the independent variable and the dependent variable. In the process of comparing these two models, the interactions that occur will be investigated.

The following is a detailed description of the data analysis techniques used. The two variables involved in the first model in the form of simple regression both have interval measurement scales. Therefore, it is necessary to first check

whether it fulfils the assumption of normality or not. Next, we will examine the assumption of linearity between variables. The simple linear regression equation that will be compiled is as follows:

$$\hat{Y} = \beta_0 + \beta_1 X \tag{1}$$

where β_i are intercept constants and regression coefficients or *slope*.

Furthermore, the second model is multiple regression with two independent variables, one of which acts as a mediator variable. The level of education that becomes the mediator variable is a categorical variable. From the multiple regression analysis, the equation that models the multilevel relationship between the independent variable and the dependent variable is obtained as follows:

$$\hat{Y} = \beta_0 + \beta_1 X + \beta_i W_i + \beta_j X W_i + \varepsilon_i$$
 (2)

where W_i is a mediator variable in the form of ordinal or graded categories and ε_i is an error. Because there are 4 categories for the mediator variable, 4 coefficients will be obtained for X and W_i .

According to Hayes (2013) and Falta & Willett (2007), moderation analysis is used to examine and explore interactions which in the model are called 'multiplicative' [12,13]. This analysis is used to estimate the direct and indirect effects of the moderating model simultaneously. Hayes also designed a computer program to model logistic regression path analysis and used the Ordinary Least Square method called PROCESS. PROCESS can be inserted in the Statistical Package for the Social Science (SPSS), Statistical Analysis Software (SAS), or R. This study uses PROCESS with an SPSS base.

RESULTS AND DISCUSSION

Descriptive Results

As stated above, the demographic data of respondents measured in this study were the education level of parents, age of children with special needs, number of children owned by parents, and cohesiveness with their partners in educating their children. Here are the results.

Parents' Education Level

The education level is divided into 5 categories, namely elementary, junior high school, senior high school, graduate, postgraduate, and others. In Figure 2 it can be seen that most of the parents have senior high school education (around 44.26%).

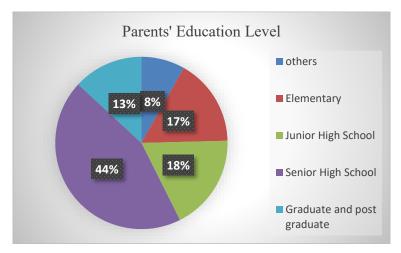


FIGURE 2. Parents' Education Level

Child's age

The age of special children owned by parents is divided into 3 categories, namely kids (6-12 years), teenagers (13-17 years), and adults (over 17 years). In Figure 3 it can be seen that most of the special children are at the age of children (about 49%).

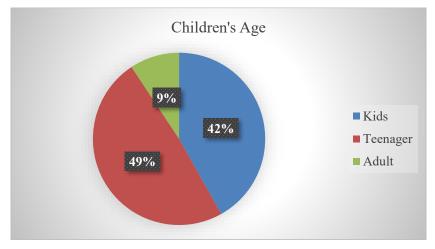


FIGURE 3. Age of special needs children

Number of children owned by parents

In Figure 4 can be seen that most parents have 2 children (40.98%).

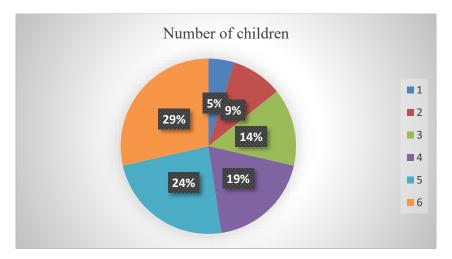


FIGURE 4. Number of children

Cohesiveness with partner

Respondents also provided information about cohesiveness with their partners in parenting. In Figure 5 it can be seen that almost all parents are compact with their partners in parenting.

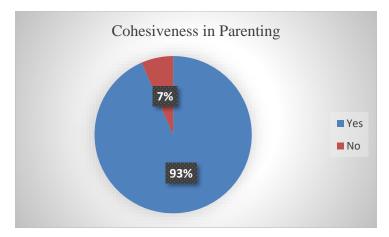


FIGURE 5. Cohesiveness with partner

In addition to subject demographic data, descriptive results were also obtained from the two variables studied, Gratitude and Parenting Dysfunctional.

Gratitude descriptive results

In Table 2 can be seen the descriptive statistics of the two variables analyzed.

TABLE 2. Descriptive results of 2 model variables

| Descriptive Measure | Gratitude | Dysfunctional parenting |
|---------------------|-----------|-------------------------|
| N (data size) | 61 | 61 |
| Range | 0,95 | 2,73 |
| Minimum | 2,28 | 1,40 |
| Maximum | 3,23 | 4,13 |
| Mean | 2,73 | 3,08 |
| Deviation Standard | 0.2432 | 0,6635 |

From the average value and standard deviation in Table 2, categorization for Gratitude is made in the Low, Middle, and High categories. In Figure 6 can be seen that most (67%) respondents are in the Middle Gratitude level.

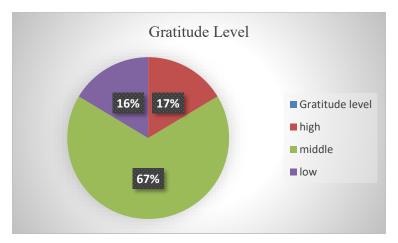


FIGURE 6. Gratitude Level

For dysfunctional parenting, no categorization will be made like Gratitude but it will be seen which aspect is the most dominant. In Figure 7 can be seen that over-reactivity is the most dominant aspect followed by verbosity.

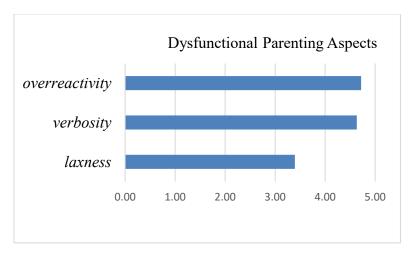


FIGURE 7. Dysfunctional Parenting Aspects

Regression Analysis

Normality Test

To fulfil the classical assumption in the use of a simple linear regression model, as the first model, firstly, a normality test was performed on both variables, Gratitude as the independent variable and Dysfunctional Parenting as the dependent variable. With the Kolmogorov-Smirnov test, it was obtained that both variables were normally distributed with the probability value above the threshold of 0.05, Gratitude $p_{value} = 0,200$, and Dysfunctional Parenting, $p_{value} = 0,200$. Graphically, it can be seen in Figure 6 and Figure 7 that these two data groups lie almost entirely in a straight line.

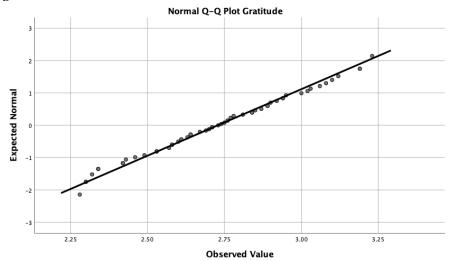


FIGURE 8. Gratitude's Q-Q Plot

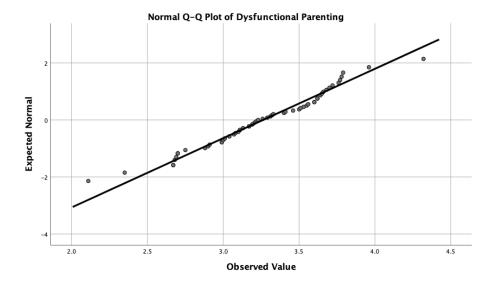


FIGURE 9. Dysfunctional Parenting Q-Q Plot

Simple linear regression analysis

The first model to be developed is a simple linear regression model with Gratitude as the independent variable and Parenting dysfunction as the dependent variable. The results are obtained in Table 3.

TABLE 3. Simple linear regression results

| Model | Unstandardized Coefficients | | | | | |
|---|-----------------------------|-------------|------|--------|------|--|
| Model | В | Std. Error. | Beta | t | Sig. | |
| 1 (Constant) | 5.719 | .609 | | 9.390 | .000 | |
| Gratitude | 998 | .222. | 504 | -4.488 | .000 | |
| a Dependent Variable: Dysfunctional Parenting | | | | | | |

The simple linear regression model obtained is

$$\hat{Y} = 5,719 - 0,998X \tag{3}$$

The existence of the two coefficients, namely the constant and the coefficient of the independent variable, are both significant with p-value = 0,000. These results were obtained from a partial test using the Student t-test. This model is also significant for the simultaneous test using analysis of variance with p-value = 0,000. While the interaction value of the two variables in the model is obtained from the value of R = -0,504 and R-square = 0,255.

Multiple linear regression analysis with moderator variables

Furthermore, the second model to be developed is a multiple linear regression model with the first independent variable being Gratitude and the second independent variable being parents' education level which acts as a moderator variable. The dependent variable is still dysfunctional parenting. The results of data analysis provide multiple regression equations containing the effect of interaction, which can be seen in equation (4) as follows:

$$\hat{Y} = 2,6461 - 0,634X + 0,4905W_1 + 0,2521W_2 + 0,3179W_3 + 0,3179W_4 - 0,8855W_1 - 0,4513W_2 - 0,5114XW_3 + 0,5099XW_4$$
 (4)

 XW_i multiplication is an interaction classified as a first-order interaction.

A model summary provides value R = 0.5899 and R-square = 0.3480 with significance value p-value = 0.0057. This shows that the model obtained is significant and has an increase of d = 0.3480 - 0.255 = 0.093. It means that

there is an increase of 9.3% with the role of the moderator variable. For the interaction effect obtained from the multiplication between Gratitude and Education Level, the coefficient obtained is -0,877 for Elementary School, 0,2469 for Junior High School, -0,4158 for Senior High School, and 0,1234 for Graduate and Post-Graduate. Positive interactions were obtained at the Junior High School and Graduate and Postgraduate levels. Meanwhile, negative interactions were obtained at Elementary School and Senior High School.

Analysis

We will begin the analysis of the descriptive results. Remember that there are three variables analyzed in this study, namely Dysfunctional Parenting, Gratitude, and Parents' Education Level. In addition, several other facts were also measured, namely the age of children with special needs, the number of children their parents have, and their cohesiveness with their partner in parenting.

The level of education is divided into 5 categories of stratification, elements, junior high school, senior high school, undergraduate to master's degree, and others. Graduates and postgraduates are intentionally combined because only a few subjects have this level of education. From Figure 2, it can be seen that the majority, about 44,26% of the parents who were the subjects of this study, had a high school education or 27 people. As for other education levels, elementary (10 people), junior high school (11 people), graduate-postgraduate (8 people), and others (5 people). Several studies have shown that there is a close relationship between the level of understanding and acceptance of parents towards their children with special needs. The Kusuma Negara research (2020) looks at the relationship between parental education and the acceptance of children with special needs. In this study, a correlation of about 36% was found [14]. The higher a person's education level, the better he will absorb information and digest it, then apply it in everyday life.

Next, we will analyze the inferential part. In the regression model, where education level acts as a moderating variable, we want to know whether education level increases gratitude and decreases dysfunctional parenting. Based on the Competency Standards for High School Graduates, individuals are expected to have an attitude dimension that is honest, caring, and responsible. Meanwhile, the knowledge dimension includes factual, conceptual, procedural, and metacognitive knowledge related to science, technology, art, and cultural science. Individuals who have graduated from senior high school are also expected to be able to relate their knowledge in the context of themselves, their families, their environment, and society (Permendikbud Number 20 of 2016).

In Figure 3 it can be seen that 42% of children with special needs aged between 6 to 12 years are included in the category of children. At this age, children with special needs are still in difficult times. At this age children are still undergoing various kinds of therapy to support their growth and development. In addition, parents are also still in a state of confusion, panic, and stress, and have not fully accepted the presence of children so dysfunctional parenting can occur [15]. In addition, parents also often feel guilty about themselves because they feel that they are the cause of their children experiencing abnormal conditions [16]. This can also be a factor in the lack of gratitude to parents.

Figure 4 shows the number of children owned by parents who have children with special needs. Most parents have 2 children (40.98%). In general, this condition is quite good and is not too burdensome for the parenting process, although one of the children is a child who needs extra attention.

This study also explores information about the cohesiveness of research subjects with their partners in caring for their children with special needs. Almost all parents (93%) stated that they were cohesive in their parenting. It can also reduce dysfunctional parenting.

The gratitude data has an interval measuring scale, so descriptive statistics can be calculated, including the mean and standard deviation. In Table 2 it can be seen that gratitude has an average of 2.73 with a score of 4 as the highest score. This means that most of the subjects have moderate Gratitude. From making the categorization involving the mean and standard deviation, it was found that about 67% of respondents had moderate gratitude. This can be seen in the diagram in Figure 6. This means that some of the subjects as parents of children with special needs are at the stage of being grateful for the presence of their children. However, there are still things that sometimes make parents worry about their children's future.

Although the dysfunctional parenting scale, although it is an interval measurement scale, categorization will not be made based on the descriptive results in Table 2. In the measuring instrument guide, Arnold et al. have classified this scale into 3 aspects that make parenting not work, namely laxness, over-reactivity, and verbosity. These three things are believed to make the parenting process not go well. The most dominant aspect can be seen in Figure 7, over-reactivity. According to Trisnadi and Andayani in their research (2021) this over-reactive condition can be seen in the discipline of parents who are authoritarian and react too quickly to children's behavior [17]. Children who are educated in this way instead of being obedient children can even become rebellious children because they feel that their parents are too restrictive and do not understand them.

Two regression models will be compared. The first model is a simple regression model and the second model is a multiple regression model with the second independent variable as the moderator variable. The simple linear regression model presented in Equation (3) shows that there is a negative effect of the independent variable on the dependent variable. What can be interpreted from this equation? If gratitude is increased by 1 unit, the dysfunctional subject in caring for children with special needs will decrease by 0.998. This means that the increase in the subject's gratitude is almost proportional to the decrease in dysfunctional parenting. The existence of the model simultaneously and partially for each coefficient and constant is statistically significant, it can be seen from the p-value = 0,000 for both tests. The magnitude of the interaction between the independent variable and the dependent variable is indicated by the value of R-square = 0,255 or 25,5%. This number can be interpreted as a prediction of a decrease in dysfunctional parenting by 25.5% if there is an increase in the subject's gratitude.

Furthermore, the second model will look at the role of parents' educational level as a moderator of the relationship between gratitude and dysfunctional parenting. This second model is a multiple regression model which involves dummy variables in the form of ordinal data or stratified categories. The interaction between independent variables and moderator variables in the form of stratified categories gives a multiplication effect. In equation (4) it can be seen that the coefficient for the independent variable gratitude is negative. This means that the lower the gratitude of parents and the role of parental education together, will increase dysfunctional parenting. This is more clearly seen from the interaction coefficient which is a multiplication between gratitude and education level where 3 of them are negative.

CONCLUSION

The existence of children with special needs in a family presents various challenges for parents. Parents must have sufficient and appropriate knowledge so that the parenting process goes well and the child experiences optimal development. The level of parental education plays a role in decreasing parenting dysfunction for children with special needs. In addition to knowledge, parents must also have a good sense of gratitude for the presence of their children with special needs. Low parental gratitude will increase parenting dysfunction which is characterized by 3 things, laxness, over-reactivity, and verbosity.

The results of this study are expected to provide arguments for experts and practitioners who are stakeholders in the world of children with special needs to improve psychoeducation for parents. This is intended so that parents get a better understanding of their children to increase gratitude for the presence of their children. In addition, parents also need to be taught about Positive Parenting [18].

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