BUKTI KORESPONDENSI

ARTIKEL JURNAL NASIONAL KESEHATAN IBU DAN ANAK

Judul artikel : *Prematurity and Language Development of Children Aged 9-18 Months*

Jurnal : Jurnal Kesehatan Ibu dan Anak

Penulis : Nurul Hidayati Hariningtyas

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1. Bukti Konfirmasi Submit Artikel dan Artikel yang disubmit (4 Februari 2022)

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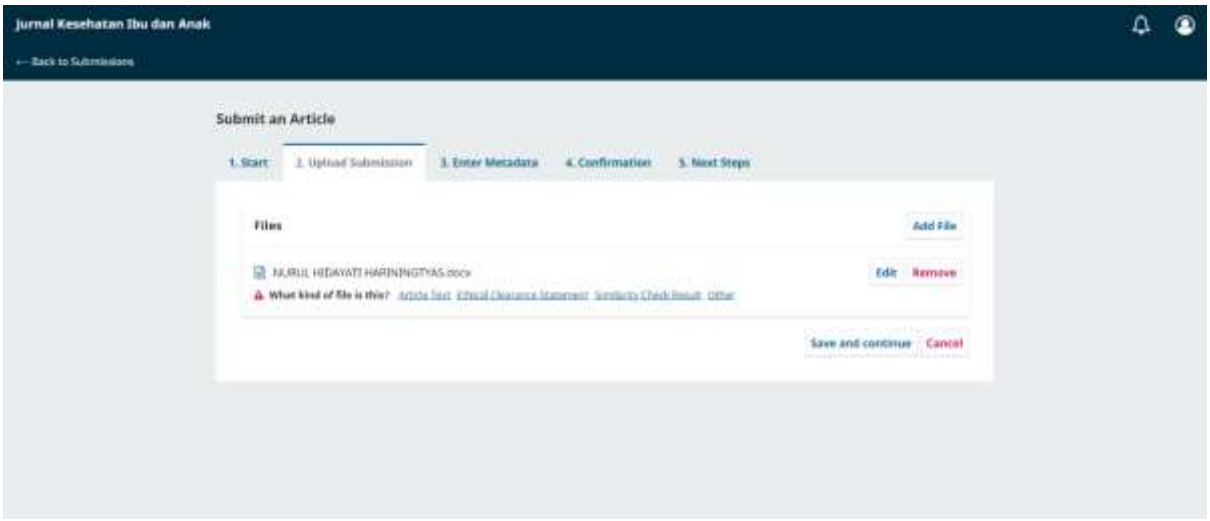

Gambar: Bukti submission (4 Februari 2022)

1.2 Bukti Naskah yang disubmit (4 Februari 2022)

CORRELATION BETWEEN PREMATURITY AND LANGUAGE DEVELOPMENT OF 9-18 MONTHS CHILD

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ABSTRACT

Background: Premature birth (gestational age <37 weeks) can caused a variety of health problems premature birth are prone for experiencing impaired children's language development in the future. **Objective:** Knowing the correlation between prematurity and language development of children aged 9-18 months. **Methods:** This research was an observational analytic study with a retrospective cohort design (historical cohort), conducted in August 2019-April 2020. The population was all infants born at Wates General Regional Hospital (RSUD) in October 2018-July 2019 in Kulon Progo Regency, the sample was 96 childrens were divided into 48 childrens in the exposed group and 48 childrens in the non-exposed group. The sampling technique used simple random sampling. The variables in this study were prematurity, smoking parents, maternal education, maternal occupation, and socio-economics. The data were obtained using instruments in the form of data collection (googleform) and Denver II forms. Data analysis used chi-square test and logistic regression. **Result:** There was a correlation between the variables of prematurity with language development. After controlling for smoking parents and mother education variable have significance (p=0.015) on the dependent variable. Developmental language disorder are 3,57 times higher in children born prematurely (OR=3,571). There was no statistically significant correlation between

maternal occupation and socio-economics on language development (p=0.525; 0.277). The chance of language development disorder if the child is born prematurely and has parents who's smoking and low maternal education is 62%.
Conclution: Prematurity is a risk factor for children's developmental language disorder.
Keywords: prematurity, language development of child

INTRODUCTION

The degree of child health is a reflection of the health status of a nation, because children are the nation's next generation, one of the indicators of the Developmental Development Goals (SDGs) as outlined in the goal of sustainable development 3 (UNICEF) suggests to accelerate the realization of the SDGs goals with prioritized development investment in children. One of the determinants of a chilrend's future quality is an optimal development which includes several aspects of functional abilities, namely cognitive, motor, emotional, social, and language. The first five years is a "golden period" or "window of opportunity" or "critical period" for the optimization of growth and it also clarify that the age below the first five years of life is an important period in preventing developmental deviations as well in optimizing development.[1,2]

According to WHO, 2 to 5 percent of children suffer from Minimal Brain Dysfunction (M.B.D) including fine motor disorders. Children are born with the ability to develop speech and language skills. Language development is the child's ability to respond to sounds, follow commands and speak politely. Children can convey their desires and opinions to others through language. [3]

Some data show that the incidence of children who experience speech delay is quite high. A research in the United States reports the prevalence of combination of speech and language delays in children aged 0 to 5 years is between 3% to 10%. Children under five in Indonesia who experience speech and language delays reach 23% to 24.6%. They are at risk of learning, reading, and writing difficulties. If intervention is not carried out, children can experience reading impairment, verbal ability, behavior problems and **psychosocial adjustments**. The most rapid language development occurs at the age of 6 to 18 months. Factors that affect children's language development are divided into two, namely, internal factors including perception, cognition and prematurity and external factors including maternal education, parenting, and socio-economics. [4]

Every year, the incidence rate of preterm labor is quite high. There are around 15 a million babies are born prematurely, which is 1 in 6 preterm births. That means, of the 100 babies born as many as 15.5 of them have premature

births. The prevalence of premature events, especially in Wates General Regional Hospital reaches 12.30% in 2018. Prematurity is a major health problem because it can cause a high risk of disruption in children's development. Premature babies (gestational age <37 weeks) born with low birth weight (<2500 grams). This condition can increase the risk of developmental disorders.

Premature babies have a high risk of disorders that need to be cautious about. Long-term complications that may occur in premature babies such as chronic lung disease, vision problems, hearing loss, cerebral palsy, and other growth and development disorders. Efforts to foster children's language development is still very little, even though the problem needs to be handled properly so that children can develop normally. [7]

This study aims to determine the correlation between prematurity and language development of children aged 9 to18 months in Kulon Progo. This research refers to the scope of the implementation of maternal and child services that are expected to develop midwifery empirically for health workers in general as well as midwifery students in particular. In addition, it is also as information to cope with premature births that are at risk of experiencing developmental language disorder, and can be one source of knowledge to increase awareness to provide stimulation at every stage of the children's age.

METHOD

This type of research was an analytic observational with a retrospective cohort design. This study observed the subject on risk factors and then assessed the effects that occur within a certain time period. This research was conducted in March to April 2020. The population was all babies born on October 2018 to July 2019 at Wates General Regional Hospital. The research sample was taken by simple random sampling technique. Samples were selected from 716 births using the random method so that 96 respondents were obtained.[8]

The independent variable in this study was prematurity. The dependent variables were children's language development, smoking parents, maternal education, maternal occupation and socio-economics as external variables. Operational definition of the study variables; 1. The gestational age at birth was seen from the medical record at Wates Regional Hospital with gestational age of premature birth <37 weeks and gestational age of normal birth ≥37 weeks, parameter with nominal scale. 2. The results of measuring language development were obtained by comparing the children's behavior during the test or asking items to the mother which was then assessed by Denver II. The parameter used was a nominal scale examination test score. The results of examinations of children's

language development tests were obtained with Denver II in the form of 10 test items with two results, namely disorder and normal.

The procedure of the study was conducted door-to-door in Kulon Progo for two weeks. Then, 25 respondents were obtained. Due to the impact of the COVID-19 pandemic, the method was changed by contacting the respondents one by one via sms / whatsapp / telephone and distributing the questionnaires in the form of Google form which contained data and questions examination of children's language development tests according to Denver II. This was conducted for four weeks to get 71 respondents. Therefore, 48 premature groups and 48 non-premature groups were obtained. To determine the correlation between two variables, chi-square test data analysis was used. Then, it was continued with the aim to find out the effect of risk on language development with logistic regression test.

RESULT

The total subjects in this study were 96 respondents who were divided into two groups: the exposed group and the unexposed group. Based on the examination results, the following results are obtained:

Table 1. The Frequency Distribution of Characteristics of The Research Subjects with Prematurity

No	Variable	Prematurity				p-*value*
		Premature		Not premature		
		n	%	N	%	
1	Smoking Parents					
	-Yes	32	66,7%	27	56,3%	0,294
	-No	16	33,3%	21	43,8%	
2	Maternal Education Level					
	-Low	20	41,7%	18	37,5%	0,676
	-High	28	58,3%	30	62,5%	
3	Maternal Occupation					
	-Unemployrf	32	66,7%	32	66,7%	1,000
	-Employed	16	33,3%	16	33,3%	
4	Socio-economy					
	-Low	26	54,2%	24	50,0%	0,683
	-High	22	45,0%	24	50,0%	

Based on the table, it can be seen that respondents with smoking parents have a risk of preterm birth by 66.7%, the proportion of respondents with educated mothers in the category of premature children born by 41.7%, respondent mothers not working have a risk of giving birth premature by 66, 7%, and respondents born prematurely with socio-economic disadvantages of 54.2%.

From this table, it can be seen that the characteristics of smoking parents, maternal education, maternal occupation, and socio-economic respondents

obtained p-value> 0.05 which means that the two groups have similar or comparable characteristics so that it will not affect the results of the study.

Table 2. The Correlation between Prematurity and External Variables with Language Development in Children Aged 9 to 18 Months

No	Variable	Children's Language Development				p-*value*	OR	95%CI
		Disorders		Normal				
		n	%	n	%			
1	Prematurity							
	-Yes	20	71,4%	28	41,2%	0,007	3,571	1,379-9,249
	-No	8	28,6%	40	58,8%			
2	Smoking Parents							
	-Yes	22	78,6%	37	54,4%	0,027	3,072	1,107-8,529
	-No	6	21,4%	31	45,6%			
3	Maternal Education							
	-Low	15	53,6%	23	33,8%	0,072	2,258	0,921-5,534
	-High	13	46,4%	45	66,2%			
4	Maternal Occupation							
	-Unemployed	20	71,4%	23	33,8%	0,525	1,364	0,523-3,558
	-Employed	8	28,6%	24	35,3%			
5	Socioeconomic							
	-Low	17	60,7%	33	48,5%	0,277	1,639	0,670-4,012
	-High	11	39,3%	35	51,5%			

The statistical test used was chi-square with strength if the value of p> 0.05, it indicates that there was a statistically significant correlation. The results of the analysis of the variable prematurity with language development disorders of children aged 9 to18 months more in children with premature birth (71.4%) than children with normal birth (28.6%). Based on statistical tests, there was a significant correlation between prematurity and language development (p-value 0.007).

Based on the results of the variable analysis, children with parents who smoke have a greater risk of language developmental disorders (78.6%), while children with have parents who do not smoke (21.4%). Based on statistical tests, there was a significant correlation between smoking parents and language development with a p-value of 0.05 <0.027.

The table explains that the results of the analysis of low maternal education variables have a risk of children experiencing language development disorders as much as 53.6% compared to children who have mothers with high maternal education as much as 46.4%. Based on the results of statistical tests, there was a significant correlation between maternal education and language development (p-value 0.072).

The table explains that children who with unemployed mothers experience language development disorders as much as 71.4%, while children with working

mothers as much as 28.6%. Both of these variables have a p-value of 0.525 and it can be concluded that the variable had no effect on language development.

The table explains that children from families with low socioeconomic status are more likely to experience language development disorders as much as 60.7% compared to children from families with high socioeconomic status as much as 39.3%. P-value of 0.277 was obtained from the two variables which means it has no effect on language development.

Table 3. The Correlation between Prematurity and Children's Language Development Aged 9 - 18 Months

Variable	B	p-*value*	Exp(B)	95% CI	
				Lower	*Upper*
Prematurity	1,235	0,015	3,439	1,277	9,265
Smoking parents	1,125	0,041	3,080	1,050	9,035
Maternal Education	0,895	0,069	2,447	0,931	6,428
Constanta	-3,774	0.005	0,023		

The statistical test used was a logistic regression test with the provisions that only variables that had p <0.25 in the bivariate analysis performed a logistic regression test. Based on the multivariate analysis, the variable prematurity was more influential on language development compared to the smoking parents variable. Judging from the p-value of 0.015 <0.05, it showed that prematurity was very significant in affecting language development, so does the smoking parent variable having a p-value of 0.041 <0.05 affecting language development, while the mother education variable has p-value 0.069> 0.05 which means that statistically has no significant effect on language development.

Prematurity increases the risk of language impairment by 3.43 times (OR = 3.439). The probability of an individual to experience developmental language disorder based on predictor values is calculated by the equation: children born prematurely, smoking parents and maternal education in the low category are at risk of experiencing language development disorders of children aged 9-18 months by 62%.

DISCUSSION

This research examines the correlation between prematurity and language development of children aged 9-18 months with external variables smoking parents, maternal education, maternal occupation, and socioeconomic of the 96 respondents. Based on the results of the study, it is known that most of the respondents have parents who smoke, high maternal education, unemployed mother, and low socioeconomic status. Developmental language disorder in children is found in the group of children with premature birth, children with

smoking parents, children from mothers with low education, children from unemployed mothers, and children whi come from families with low socioeconomic status.

The results of the analysis with the chi-square test aims to test the correlation of each independent variable to the outcome variable. It showed that the incidence of prematurity had a statistically significant correlation to the language development variables of children aged 9-18 months. The results of p-value <0.05 (p = 0.007; OR: 3.439; 95% CI: 1.277-9.265).

Thus, Ho is rejected and Ha is accepted. It means prematurity has a correlation with children's language development. The OR results on this variable also mean that children with premature birth are 3.43 times more likely to experience developmental language disorder in children aged 9-18 months than children with normal birth. The risk of developmental language disorder will more likely to be experience in children with premature birth, children with smoking parents, and children with low-educated mothers is 62%.

In theory, premature birth is a birth with the gestational age between 20 weeks to no more than than 37 weeks. Premature is a major cause of neurodevelopmental disabilities in children and can give effect throughout life because of disruption of nerve development functions. Disorders of language development are included in more subtle forms of neurodevelopmental disorders.[9]

Children with a history of preterm birth are at greater risk of experiencing disorders because significant brain development occurs in the last 4-6 weeks of pregnancy. The risk of experiencing disorder will increase in babies born at a young gestational age. According to neuropsycholinguistic theory, language involves complex elements, namely: brain function (cerebral cortex), semantics and fragmatics, phonology, grammar, and organs that reproduce language because these systems are interconnected. [10, 11]

This study is in accordance with research conducted by Ana Claudia et.al., (2017), conducted in premature children (gestational age <37 weeks) which shows that prematurity significantly affect the occurrence of children's language developmental disorders (p <0.01). This is because at the 6-18 months stage, a critical period of brain development occurs when neurogenesis, gliogenesis, neuron migration, and myelination process take place rapidly. [12]

A systematic review by Arpi and Ferrari (2013) shows that the relationship of prematurity with the disorder that occurs is not always significant. Even so, the prevalence of disorders in premature children is greater than children born at term. [13]

The relationship between parent smoking statistically has a relationship with language development. This study is in accordance with research conducted by Nadine F, et.al., (2014), which states that parents who smoke or mothers who are exposed to cigarette smoke during pregnancy cause the child to be born prematurely and will affect the child's language development (p-value 0.041) . Smoking parents will be at risk of having placental abscess, low infant weight, infant mortality, and causing premature rupture of membranes resulting in earlier labor. Cigarettes have a negative effect on the child to adulthood because it affects the child's development during the womb until outside the womb. [14]

Maternal education factors indicate that this factor is related to children's language development and is a risk factor. This study is in line with q study conducted by Yenny (2016) which stated that there is a statistically significant correlation between children's language development and maternal education (p-value 0,000). Even though the maternal education level affects the child's language development, stimulation can still be obtained outside the maternal education as the primary caregiver, so it is not an absolute factor. [15]

Developmental language disorder is more common in children who born prematurely to unemployed mothers to employed mothers. Relevant to research conducted by Jeane, et.al (2012) stated that the employment status of mothers with child language development is statistically unrelated (p-value 0.317). [16] According to the research of Buehler and O'Brien (2012), children born prematurely to mothers who work part-time have good spoken language. Figures show that children born prematurely to part-time working mothers compared to mothers who do not work has 3.32 times in doing a higher proportion of child care and domestic work than mothers who work all day long. [17]

The results of this study indicate that socioeconomic status is not statistically related to developmental language disorder. The results is also supported by the study conducted by Yenny (2016), which stated that there is no significant correlation between socioeconomic and children's language development (p-value 0.517) .15 According to Sania, et.al (2018), status socioeconomic family can affect language development in children because socioeconomic role in fulfilling nutritional status, needs and affect the development process. [18] Based on the results of research and theory, socioeconomic factors here do not affect the development of children's language. This is due to the strong factors of the family environment and social environment which further affect children's language development.

CONCLUSION

Based on the results of data analysis and discussion in this study, the following conclusions can be drawn; (1) There is statistically significant correlation between prematurity (p = 0.007), smoking parents (p = 0.027), maternal education (p = 0.072) and language development; (2) There is no statistically significant correlation between maternal employment (p = 0.525) and socioeconomic (p = 0.277), on language development; (3) The risk of developmental language disorder for children born prematurely, smoking parents, and having a mother with low education is 62%; (4) Prematurity increases the risk of children's developmental language disorder by 3.43 times (OR adjusted = 3,439); (5) Developmental language disorder are 3.57 times higher in children with premature birth (OR = 3,571).

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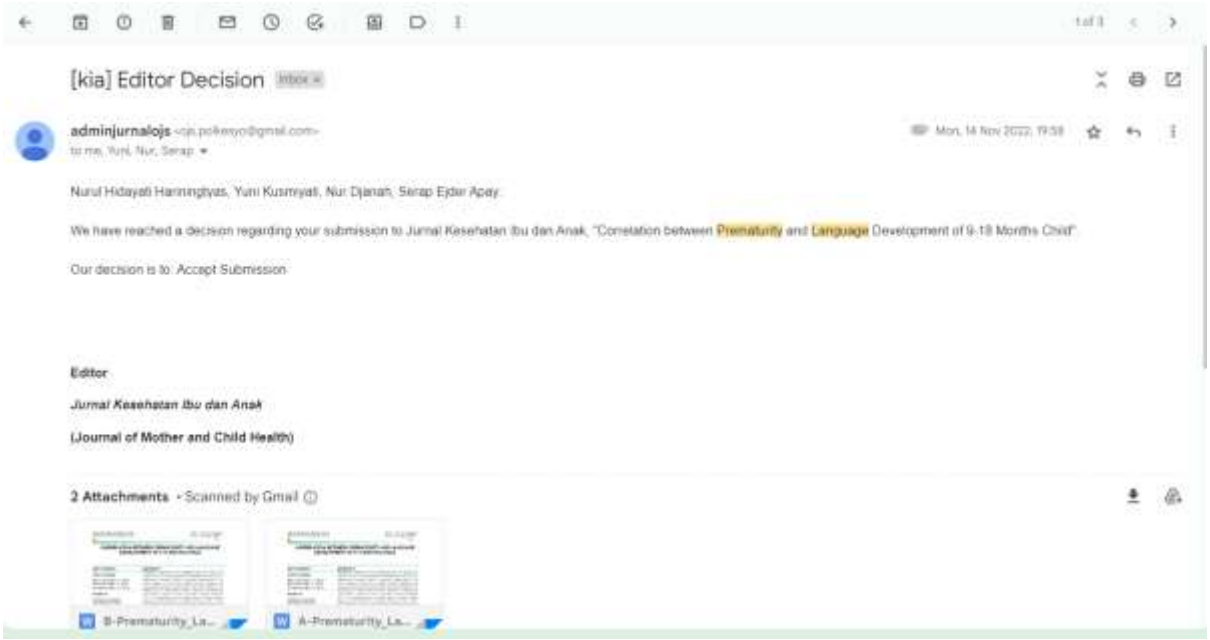
BMJ Open 2019;9:e026449. doi:10.1136/bmjopen-2018-026449. (2018).

2. Revisi Naskah dan Pengiriman Naskah yang Telah direvisi



[kia] Editor Decision

adminjurnalojs

Nurul Hidayati Haningtyas, Yuni Kusmiyati, Nur Djanah, Serap Ejder Apay

We have reached a decision regarding your submission to Jurnal Kesehatan Ibu dan Anak, "Correlation between Prematurity and Language Development of 9-18 Months Child".

Our decision is to: Accept Submission

Editor

Jurnal Kesehatan Ibu dan Anak

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PREMATURITY AND LANGUAGE DEVELOPMENT OF CHILDREN AGED 9-18 MONTHS

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ABSTRACT

Prematurity can cause various health problems, including language development disorders in children. The purpose of the study was to determine the relationship between prematurity and language development of children aged 9-18 months. This type of research is observational with a retrospective cohort design. The subjects were all babies born at Wates Hospital from 2018 to 2019, totaling 96. They were taken by simple random sampling. The independent variable is prematurity, and the dependent variable is language development as measured using Denver II. Data analysis used logistic regression. Results: There is a relationship between prematurity and language development, after controlling for the external variables of smoking and mother's education. Babies born prematurely have a 3.57 times risk of experiencing language development disorders than babies born at term. The chance of babies born prematurely with smoking parents experiencing language development disorders is 62%. Prematurity is a risk factor for children's language development disorders

Corresponding Author:

INTRODUCTION

The degree of child health is a reflection of the health status of a nation, because children are the nation's next generation, one of the indicators of the Developmental Development Goals (SDGs) as outlined in the goal of sustainable development 3 (UNICEF) suggests to accelerate the realization of the SDGs goals with prioritized development investment in children. One of the determinants of a chilrend's future quality is an optimal development which includes several aspects of functional abilities, namely cognitive, motor, emotional, social, and language. The first five years is a "golden period" or "window of opportunity" or "critical period" for the optimization of growth and it also clarify that the age below the first five years of life is an important period in preventing developmental deviations as well in optimizing development.(1,2)

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perception, cognition and prematurity and external factors including maternal education, parenting, and socio-economics.(4)

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Premature babies have a high risk of disorders that need to be cautious about. Long-term complications that may occur in premature babies such as chronic lung disease, vision problems, hearing loss, cerebral palsy, and other growth and development disorders. Efforts to foster children's language development is still very little, even though the problem needs to be handled properly so that children can develop normally.(7)This study aims to determine the correlation between prematurity and language development of children aged 9 to18 months. i. This research refers to the scope of the implementation of maternal and child services that are expected to develop midwifery empirically for health workers in general as well as midwifery students in particular. In addition, it is also as information to cope with premature births that are at risk of experiencing developmental language disorder, and can be one source of knowledge to increase awareness to provide stimulation at every stage of the children's age.

METHOD

This type of research was an analytic observational with a retrospective cohort design. This research was conducted in March to April 2020. The Subject was all babies born on October 2018 to July 2019 at Wates Hospital, with simple random sampling technique. Samples were selected from 716 births using the random method so that 96 respondents were obtained.(8)

The independent variable in this study was prematurity. The dependent variables were children's language development, and external variables are smoking parents, maternal education, maternal occupation and socio-economics. Prematurity was seen from the medical record at Wates Hospital with gestational age of premature birth <37 weeks and gestational age of normal birth ≥37 weeks, parameter with nominal scale. Measuring language development were obtained by comparing the children's behavior during the test or asking items to the mother which was then assessed by Denver II. The parameter used was a nominal scale examination test score. The results of examinations of children's language development tests were obtained with Denver II in the form of 10 test items with two results, namely disorder and normal.

The procedure of the study was conducted door-to-door in Kulon Progo for two weeks. Then, 25 respondents were obtained. Due to the impact of the COVID-19 pandemic, the method was changed by contacting the respondents one by one via sms / whatsapp / telephone and distributing the questionnaires in the form of Google form which contained data and questions examination of children's language development tests according to Denver II. This was conducted for four weeks to get 71 respondents. Therefore, 48 premature groups and 48 non-premature groups were obtained. To determine the correlation between two variables, chi-square test data analysis was used. Then, it was continued with the aim to find out the effect of risk on language development with logistic regression test. This research has obtained permission from the research ethics committee.

RESULT

The total subjects in this study were 96 respondents who were divided into two groups: the exposed group and the unexposed group. Based on the examination results, the following results are obtained:

Table 1. Characteristics of The Research Subjects with Prematurity

Variable	Prematurity				p-value
	Premature		No premature		
	n	%	N	%	
Smoking Parents					
-Yes	32	66.7%	27	56.3%	0.294
-No	16	33.3%	21	43.8%	
Maternal Education Level					
-Low	20	41.7%	18	37.5%	0.676
-High	28	58.3%	30	62.5%	
Maternal Occupation					
-Unemployrf	32	66.7%	32	66.7%	1.000
-Employed	16	33.3%	16	33.3%	
Socio-economy					
-Low	26	54.2%	24	50.0%	0.683
-High	22	45.0%	24	50.0%	

Based on the table 1, it can be seen that respondents with smoking parents have a risk of preterm birth by 66.7%, the proportion of respondents with educated mothers in the category of premature children born by 41.7%, respondent mothers not working have a risk of giving birth premature by 66, 7%, and respondents born prematurely with socio-economic disadvantages of 54.2%.

From this table, it can be seen that the characteristics of smoking parents, maternal education, maternal occupation, and socio-economic respondents obtained p-value> 0.05 which means that the two groups have similar or comparable characteristics so that it will not affect the results of the study.

Table 2. The Correlation between Prematurity and External Variables with Language Development in Children Aged 9 to 18 Months

Variable	Children's Language Development				p-value	OR	95%CI
	Disorders		Normal				
	n	%	n	%			
Prematurity							
-Yes	20	71.4%	28	41.2%	0.007	3.571	1.379-9.249
-No	8	28.6%	40	58.8%			
Smoking Parents							
-Yes	22	78.6%	37	54.4%	0.027	3.072	1.107-8.529
-No	6	21.4%	31	45.6%			
Maternal Education							
-Low	15	53.6%	23	33.8%	0.072	2.258	0.921-5.534
-High	13	46.4%	45	66.2%			
Maternal Occupation							
-Unemployed	20	71.4%	23	33.8%	0.525	1.364	0.523-3.558
-Employed	8	28.6%	24	35.3%			
Socioeconomic							
-Low	17	60.7%	33	48.5%	0.277	1.639	0.670-4.012
-High	11	39.3%	35	51.5%			

The statistical test used was chi-square with strength if the value of p> 0.05, it indicates that there was a statistically significant correlation. The results of the analysis of the variable prematurity with language development disorders of children aged 9 to18 months more in children with premature birth (71.4%) than children with normal birth (28.6%). Based on statistical tests, there was a significant correlation between prematurity and language development (p-value 0.007).

Based on the results of the variable analysis, children with parents who smoke have a greater risk of language developmental disorders (78.6%), while children with have parents who do not smoke (21.4%). Based on statistical tests, there was a significant correlation between smoking parents and language development with a p-value of 0.05 <0.027.

The table explains that the results of the analysis of low maternal education variables have a risk of children experiencing language development disorders as much as 53.6% compared to children who have mothers with high maternal education as much as 46.4%. Based on the results of statistical tests, there was a significant correlation between maternal education and language development (p-value 0.072).

The table explains that children who with unemployed mothers experience language development disorders as much as 71.4%, while children with working mothers as much as 28.6%. Both of these variables have a p-value of 0.525 and it can be concluded that the variable had no effect on language development.

The table explains that children from families with low socioeconomic status are more likely to experience language development disorders as much as 60.7% compared to children from families with high socioeconomic status as much as 39.3%. P-value of 0.277 was obtained from the two variables which means it has no effect on language development.

Table 3. The Correlation between Prematurity and Children's Language Development Aged 9 - 18 Months

Variable	B	p-value	Exp(B)	95% CI	
				Lower	*Upper*
Prematurity	1.235	0.015	3.439	1.277	9.265
Smoking parents	1.125	0.041	3.080	1.050	9.035
Maternal Education	0.895	0.069	2.447	0.931	6.428
Constanta	-3.774	0.005	0.023		

The statistical test used was a logistic regression test with the provisions that only variables that had p <0.25 in the bivariate analysis performed a logistic regression test. Based on the multivariate analysis, the variable prematurity was more influential on language development compared to the smoking parents variable. Judging from the p-value of 0.015 <0.05, it showed that prematurity was very significant in affecting language development, so does the smoking parent variable having a p-value of 0.041 <0.05 affecting language development, while the mother education variable has p-value 0.069> 0.05 which means that statistically has no significant effect on language development.

Prematurity increases the risk of language impairment by 3.43 times (OR = 3.439). The probability of an individual to experience developmental language disorder based on predictor values is calculated by the equation: children born prematurely, smoking parents and maternal education in the low category are at risk of experiencing language development disorders of children aged 9-18 months by 62%.

DISCUSSION

This research examines the correlation between prematurity and language development of children aged 9-18 months with external variables smoking parents, maternal education, maternal occupation, and socioeconomic of the 96 respondents. Based on the results of the study, it is known that most of the respondents have parents who smoke, high maternal education, unemployed mother, and low socioeconomic status. Developmental language disorder in children is found in the group of children with premature birth, children with smoking parents, children from mothers with low education, children from unemployed mothers, and children whi come from families with low socioeconomic status.

The results of the analysis with the chi-square test aims to test the correlation of each independent variable to the outcome variable. It showed that the incidence of prematurity had a statistically significant correlation to the language development variables of children aged 9-18 months. The results of p-value <0.05 (p = 0.007; OR: 3.439; 95% CI: 1.277-9.265).

Thus, Ho is rejected and Ha is accepted. It means prematurity has a correlation with children's language development. The OR results on this variable also mean that children

with premature birth are 3.43 times more likely to experience developmental language disorder in children aged 9-18 months than children with normal birth. The risk of developmental language disorder will more likely to be experience in children with premature birth, children with smoking parents, and children with low-educated mothers is 62%.

In theory, premature birth is a birth with the gestational age between 20 weeks to no more than than 37 weeks. Premature is a major cause of neurodevelopmental disabilities in children and can give effect throughout life because of disruption of nerve development functions. Disorders of language development are included in more subtle forms of neurodevelopmental disorders.(9)

Children with a history of preterm birth are at greater risk of experiencing disorders because significant brain development occurs in the last 4-6 weeks of pregnancy. The risk of experiencing disorder will increase in babies born at a young gestational age. According to neuropsycholinguistic theory, language involves complex elements, namely: brain function (cerebral cortex), semantics and fragmatics, phonology, grammar, and organs that reproduce language because these systems are interconnected. (10, 11)

This study is in accordance with research conducted by Ana Claudia et.al., (2017), conducted in premature children (gestational age <37 weeks) which shows that prematurity significantly affect the occurrence of children's language developmental disorders (p <0.01). This is because at the 6-18 months stage, a critical period of brain development occurs when neurogenesis, gliogenesis, neuron migration, and myelination process take place rapidly. (12)

A systematic review by Arpi and Ferrari (2013) shows that the relationship of prematurity with the disorder that occurs is not always significant. Even so, the prevalence of disorders in premature children is greater than children born at term. (13)

The relationship between parent smoking statistically has a relationship with language development. This study is in accordance with research conducted by Nadine F, et.al., (2014), which states that parents who smoke or mothers who are exposed to cigarette smoke during pregnancy cause the child to be born prematurely and will affect the child's language development (p-value 0.041) . Smoking parents will be at risk of having placental abscess, low infant weight, infant mortality, and causing premature rupture of membranes resulting in earlier labor. Cigarettes have a negative effect on the child to adulthood because it affects the child's development during the womb until outside the womb. (14)

Maternal education factors indicate that this factor is related to children's language development and is a risk factor. This study is in line with q study conducted by Yenny (2016) which stated that there is a statistically significant correlation between children's language development and maternal education (p-value 0,000). Even though the maternal education level affects the child's language development, stimulation can still be obtained outside the maternal education as the primary caregiver, so it is not an absolute factor. (15)

Developmental language disorder is more common in children who born prematurely to unemployed mothers to employed mothers. Relevant to research conducted by Jeane, et.al (2012) stated that the employment status of mothers with child language development is statistically unrelated (p-value 0.317). (16) According to the research of Buehler and O'Brien (2012), children born prematurely to mothers who work part-time have good spoken language. Figures show that children born prematurely to part-time working mothers compared to mothers who do not work has 3.32 times in doing a higher proportion of child care and domestic work than mothers who work all day long. (17)

The results of this study indicate that socioeconomic status is not statistically related to developmental language disorder. The results is also supported by the study conducted by Yenny (2016), which stated that there is no significant correlation between socioeconomic and children's language development (p-value 0.517) .15 According to Sania, et.al (2018), status socioeconomic family can affect language development in children because socioeconomic role in fulfilling nutritional status, needs and affect the development process. [18] Based on the results of research and theory, socioeconomic factors here do not affect the development of children's language. This is due to the strong factors of the family environment and social environment which further affect children's language development.

CONCLUSION

Based on the results of data analysis and discussion in this study, the following conclusions can be drawn; There is statistically significant correlation between prematurity (p = 0.007), smoking parents (p = 0.027), maternal education (p = 0.072) and language development; There is no statistically significant correlation between maternal employment (p = 0.525) and socioeconomic (p = 0.277), on language development; The risk of developmental language disorder for children born prematurely, smoking parents, and having a mother with low education is 62%; Prematurity increases the risk of children's developmental language disorder by 3.43 times (OR adjusted = 3,439); Developmental language disorder are 3.57 times higher in children with premature birth (OR = 3,571).

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2. 2 Revisi

PREMATURITY AND LANGUAGE DEVELOPMENT OF CHILDREN AGED 9-18 MONTHS

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ABSTRACT

Prematurity can cause various health problems, including language development disorders in children. The purpose of the study was to determine the relationship between prematurity and language development of children aged 9-18 months. This type of research is observational with a retrospective cohort design. The subjects were all babies born at Wates Hospital from 2018 to 2019, totaling 96. They were taken by simple random sampling. The independent variable is prematurity, and the dependent variable is language development as measured using Denver II. Data analysis used logistic regression. Results: There is a relationship between prematurity and language development, after controlling for the external variables of smoking and mother's education. Babies born prematurely have a 3.57 times risk of experiencing language development disorders than babies born at term. The chance of babies born prematurely with smoking parents experiencing language development disorders is 62%. Prematurity is a risk factor for children's language development disorders

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INTRODUCTION

The degree of child health is a reflection of the health status of a nation, because children are the nation's next generation, one of the indicators of the Developmental Development Goals (SDGs) as outlined in the goal of sustainable development 3 (UNICEF) suggests to accelerate the realization of the SDGs goals with prioritized development investment in children. One of the determinants of a chilrend's future quality is an optimal development which includes several aspects of functional abilities, namely cognitive, motor, emotional, social, and language. The first five years is a “golden period” or “window of opportunity” or “critical period” for the optimization of growth and it also clarify that the age below the first five years of life is an important period in preventing developmental deviations as well in optimizing development.(1,2)

Research in the United States of America children detected developmental disorders before school age by 20-30% and in Indonesia about 45.12%. A study in Indonesia showed that 20-30% of children under five had developmental disorders, and most of them experienced delays in the gross motor and language aspects or speech, most of which were due to lack of stimulation. According to WHO, 2 to 5 percent of children suffer from Minimal Brain Dysfunction (M.B.D) including fine motor disorders. Children are born with the ability to develop speech and language skills. Language development is the child's ability to respond to sounds, follow commands and speak politely. The role of language in early childhood includes thinking, speaking, and being

able to read and write. Children can convey their desires and opinions to others through language.(3,4,5)

Some data show that the incidence of children who experience speech delay is quite high. Aresearch in the United States reports the prevalence of combination of speech and language delays in children aged 0 to 5 years is between 3% to 10%. Children under five in Indonesia who experience speech and language delays reach 23% to 24.6%, and risk of learning, reading, and writing difficulties. If intervention is not carried out, children can experience reading impairment, verbal ability, behavior problems and psychosocial adjustments. The most rapid language development occurs at the age of 6 to 18 months. Factors that affect children's language development are internal factors including perception, cognition and prematurity and external factors including maternal education, parenting, and socio-economics.(6)

The development process is the result of the interaction of genetic factors and environmental factors. Genetic factors are factors related to genes that come from the father and mother, while environmental factors include biological, physical, psychological and social. Growth problems will be more common in babies who are at high risk at the time of delivery. Babies can experience growth and development disorders such as preterm or premature neonates, low birth weight, and intraventricular hemorrhage and others.(7)

Every year, the incidence rate of preterm labor is quite high. There are around 15 a million babies are born prematurely, which is 1 in 6 preterm births. That means, of the 100 babies born as many as 15.5 of them have premature births. The prevalence of premature events, in Wates Hospital reaches 12.30% in 2018. Prematurity is a major health problem because it can cause a high risk of disruption in children's development. Premature babies (gestational age <37 weeks) born with low birth weight (<2500 grams). This condition can increase the risk of developmental disorders.(8)

Premature babies have a high risk of disorders that need to be cautious about. Long-term complications that may occur in premature babies such as chronic lung disease, vision problems, hearing loss, cerebral palsy, and other growth and development disorders. Efforts to foster children's language development is still very little, even though the problem needs to be handled properly so that children can develop normally.(9) Denver II is an instrument for early finding problems with potential developmental deviations in children aged 0-<6 years consisting of 125 items arranged in a form into four sectors, namely: the personal social sector, the fine-motor-adaptive sector, the language sector, and the gross motor sector.(10)

This study aims to determine the correlation between prematurity and language development of children aged 9 to18 months. This research refers to the scope of the implementation of maternal and child services that are expected to develop midwifery empirically for health workers in general as well as midwifery students in particular. In addition, it is also as information to cope with premature births that are at risk of experiencing developmental language disorder, and can be one source of knowledge to increase awareness to provide stimulation at every stage of the children's age.

METHOD

This type of research was an analytic observational with a retrospective cohort design. This research was conducted in March to April 2020. The Subject was all babies born on October 2018 to July 2019 at Wates Hospital, with simple random sampling technique. Samples were selected from 716 births using the random method so that 96 respondents were obtained.(11)

The independent variable in this study was prematurity. The dependent variables were children's language development, and external variables are smoking parents, maternal education, maternal occupation and socio-economics. Prematurity was seen from the medical record at Wates Hospital with gestational age of premature birth <37 weeks and gestational age of normal birth ≥37 weeks, parameter with nominal scale.

Measuring language development were obtained by comparing the children's behavior during the test or asking items to the mother which was then assessed by Denver II. The parameter used was a nominal scale examination test score. The results of examinations of children's language development tests were obtained with Denver II in the form of 10 test items with two results, namely disorder and normal.(12, 13)

The procedure of the study was conducted door-to-door in Kulon Progo for two weeks. Then, 25 respondents were obtained. Due to the impact of the COVID-19 pandemic, the method was changed by contacting the respondents one by one via sms / whatsapp / telephone and distributing the questionnaires in the form of Google form which contained data and questions examination of children's language development tests according to Denver II. This was conducted for four weeks to get 71 respondents. Therefore, 48 premature groups and 48 non-premature groups were obtained. To determine the correlation between two variables, chi-square test data analysis was used. Then, it was continued with the aim to find out the effect of risk on language development with logistic regression test. This research has obtained permission from the research ethics committee. (14)

RESULT

The total subjects in this study were 96 respondents who were divided into two groups: the exposed group and the unexposed group. Based on the examination results, the following results are obtained:

Table 1. Characteristics of The Research Subjects with Prematurity

Variable	Prematurity				p-*value*
	Premature		No premature		
	n	%	N	%	
Smoking Parents					
-Yes	32	66.7%	27	56.3%	0.294
-No	16	33.3%	21	43.8%	
Maternal Education Level					
-Low	20	41.7%	18	37.5%	0.676
-High	28	58.3%	30	62.5%	
Maternal Occupation					
-Unemployrf	32	66.7%	32	66.7%	1.000
-Employed	16	33.3%	16	33.3%	
Socio-economy					
-Low	26	54.2%	24	50.0%	0.683
-High	22	45.0%	24	50.0%	

Based on the table 1, it can be seen that respondents with smoking parents have a risk of preterm birth by 66.7%, the proportion of respondents with educated mothers in the category of premature children born by 41.7%, respondent mothers not working have a risk of giving birth premature by 66, 7%, and respondents born prematurely with socio-economic disadvantages of 54.2%.

From this table, it can be seen that the characteristics of smoking parents, maternal education, maternal occupation, and socio-economic respondents obtained p-value> 0.05 which means that the two groups have similar or comparable characteristics so that it will not affect the results of the study.

Table 2. The Correlation between Prematurity and External Variables with Language Development in Children Aged 9 to 18 Months

Variable	Children's Language Development				p-*value*	OR	95%CI
	Disorders		Normal				
	n	%	n	%			
Prematurity							
-Yes	20	71.4%	28	41.2%	0.007	3.571	

-No	8	28.6%	40	58.8%			1.379-9.249
Smoking Parents							
-Yes	22	78.6%	37	54.4%	0.027	3.072	1.107-8.529
-No	6	21.4%	31	45.6%			
Maternal Education							
-Low	15	53.6%	23	33.8%	0.072	2.258	0.921-5.534
-High	13	46.4%	45	66.2%			
Maternal Occupation							
-Unemployed	20	71.4%	23	33.8%	0.525	1.364	0.523-3.558
-Employed	8	28.6%	24	35.3%			
Socioeconomic							
-Low	17	60.7%	33	48.5%	0.277	1.639	0.670-4.012
-High	11	39.3%	35	51.5%			

The statistical test used was chi-square with strength if the value of p> 0.05, it indicates that there was a statistically significant correlation. The results of the analysis of the variable prematurity with language development disorders of children aged 9 to18 months more in children with premature birth (71.4%) than children with normal birth (28.6%). Based on statistical tests, there was a significant correlation between prematurity and language development (p-value 0.007).

Based on the results of the variable analysis, children with parents who smoke have a greater risk of language developmental disorders (78.6%), while children with have parents who do not smoke (21.4%). Based on statistical tests, there was a significant correlation between smoking parents and language development with a p-value of 0.05 <0.027.

The table explains that the results of the analysis of low maternal education variables have a risk of children experiencing language development disorders as much as 53.6% compared to children who have mothers with high maternal education as much as 46.4%. Based on the results of statistical tests, there was a significant correlation between maternal education and language development (p-value 0.072).

The table explains that children who with unemployed mothers experience language development disorders as much as 71.4%, while children with working mothers as much as 28.6%. Both of these variables have a p-value of 0.525 and it can be concluded that the variable had no effect on language development.

The table explains that children from families with low socioeconomic status are more likely to experience language development disorders as much as 60.7% compared to children from families with high socioeconomic status as much as 39.3%. P-value of 0.277 was obtained from the two variables which means it has no effect on language development.

Table 3. The Correlation between Prematurity and Children's Language Development Aged 9 - 18 Months

Variable	B	p-*value*	Exp(B)	95% CI	
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Prematurity	1.235	0.015	3.439	1.277	9.265
Smoking parents	1.125	0.041	3.080	1.050	9.035
Maternal Education	0.895	0.069	2.447	0.931	6.428
Constanta	-3.774	0.005	0.023		

The statistical test used was a logistic regression test with the provisions that only variables that had p <0.25 in the bivariate analysis performed a logistic regression test. Based on the multivariate analysis, the variable prematurity was more influential on language development compared to the smoking parents variable. Judging from the p-value of 0.015 <0.05, it showed that prematurity was very significant in affecting language development, so does the smoking parent variable having a p-value of 0.041 <0.05 affecting language development, while the mother education variable has p-value

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DISCUSSION

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The results of the analysis with the chi-square test aims to test the correlation of each independent variable to the outcome variable. It showed that the incidence of prematurity had a statistically significant correlation to the language development variables of children aged 9-18 months. The results of p-value <0.05 (p = 0.007; OR: 3.439; 95% CI: 1.277-9.265).

Thus, Ho is rejected and Ha is accepted. It means prematurity has a correlation with children's language development. The OR results on this variable also mean that children with premature birth are 3.43 times more likely to experience developmental language disorder in children aged 9-18 months than children with normal birth. The risk of developmental language disorder will more likely to be experience in children with premature birth, children with smoking parents, and children with low-educated mothers is 62%.

In theory, premature birth is a birth with the gestational age between 20 weeks to no more than than 37 weeks. Premature is a major cause of neurodevelopmental disabilities in children and can give effect throughout life because of disruption of nerve development functions. Disorders of language development are included in more subtle forms of neurodevelopmental disorders. In theory, premature birth is defined as the birth of a baby between 20 weeks and less than 37 weeks of gestation. Prematurity is a major cause of neurodevelopmental disabilities in children and can have lifelong effects due to impaired neurodevelopmental function. Language development disorders are included in neurodevelopmental disorders in a more subtle form. (15)

Children with a history of preterm birth are at greater risk of experiencing disorders because significant brain development occurs in the last 4-6 weeks of pregnancy. The risk of experiencing disorder will increase in babies born at a young gestational age. According to neuropsycholinguistic theory, language involves complex elements, namely: brain function (cerebral cortex), semantics and fragmatics, phonology, grammar, and organs that reproduce language because these systems are interconnected. (16, 17)

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Maternal education factors indicate that this factor is related to children's language development and is a risk factor. This study is in line with q study conducted by Yenny (2016) which stated that there is a statistically significant correlation between children's language development and maternal education (p-value 0,000). Even though the maternal education level affects the child's language development, stimulation can still be obtained outside the maternal education as the primary caregiver, so it is not an absolute factor.(21)

Developmental language disorder is more common in children who born prematurely to unemployed mothers to employed mothers. Relevant to research conducted by Jeane, et.al (2012) stated that the employment status of mothers with child language development is statistically unrelated (p-value 0.317). According to the research of Buehler and O'Brien (2012), children born prematurely to mothers who work part-time have good spoken language. Figures show that children born prematurely to part-time working mothers compared to mothers who do not work has 3.32 times in doing a higher proportion of child care and domestic work than mothers who work all day long.(22) This study is relevant to the results of the chi-square analysis with a p-value of 0.525 > 0.05 can experience a risk of 1.36 times (95% CI 0.523-3.558) of language development disorders in children born prematurely with mothers who do not work compared to working mothers.(23)

The results of this study indicate that socioeconomic status is not statistically related to developmental language disorder. The results is also supported by the study conducted by Yenny (2016), which stated that there is no significant correlation between socio-economic and children's language development (p-value 0.517) According to Sania, et.al (2018), status socio-economic family can affect language development in children because socio-economic role in fulfilling nutritional status, needs and affect the development process.(24) Based on the results of research and theory, socio-economic factors here do not affect the development of children's language. This is due to the strong factors of the family environment and social environment which further affect children's language development.

CONCLUSION

Based on the results of data analysis and discussion in this study, the following conclusions can be drawn; There is statistically significant correlation between prematurity (p = 0.007), smoking parents (p = 0.027), maternal education (p = 0.072) and language development; There is no statistically significant correlation between maternal employment (p = 0.525) and socioeconomic (p = 0.277), on language development; The risk of developmental language disorder for children born prematurely, smoking parents, and having a mother with low education is 62%; Prematurity increases the risk of children's developmental language disorder by 3.43 times (OR adjusted = 3,439); Developmental language disorder are 3.57 times higher in children with premature birth (OR = 3,571).

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