Model of Premarried Sexual Behavior in Adolescent Cityof Medan in 2021 Using Logistic Regression

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Article Info	ABSTRACT
	In this study, the problem taken was premarital sexual behavior in adolescents in Medan City in 2021, by looking at the shift in the norms of right and wrong, good and bad, especially in the context of sexual behavior becoming increasingly real. The purpose of this study is to determine a model of premarital sexual behavior in adolescents in Medan City in 2021 by using logistic regression to carry out a prevention by looking at what variable factors have a significant relationship to the level of premarital sexual behavior that occurs in Medan City. In this study, there were 100 samples that had been taken using Cluster RandomSampling with four predictor variables, namely media, attitudes, knowledge and parental roles and the response variable, namely premarital sexual behavior in adolescents. Based onbinary logistic regression, the model obtained is $P(x) = \frac{\exp(-1,579X_1 + 1,156X_2 + 1,636X_3 + 1,624X_4)}{1 + \exp(-1,579X_1 + 1,156X_2 + 1,636X_3 + 1,624X_4)}$ with the smallest G test value and each model on multiple variables, it can be seen that theentire value of Cox & Snell and Nagelkerke ($R2$) < 0.50 in the overall parameter significance test which states that the level of effective contribution given by each predictor variable to the response variable has not enough to be used as a model of premarital sexual behavior inadolescents in Medan City in 2021. This means that there are other variables besides media, knowledge, attitudes and parental roles that can affect the level of premarital sexual behavior in adolescents in Medan City in 2021

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INTRODUCTION

Logistic regression model is an approach to make predictive models such as linear regression orcommonly referred to as Ordinary Least Squares (OLS) regression. The difference is that logisticregression is used to predict the dependent variable on a dichotomous scale. The dichotomousscale is a nominal data scale with two categories, for example: yes and no, good and bad orhigh and low. The logistic regression model in which there are two types of response variables iscalled a binary logistic regression model. Meanwhile, a logistic regression model whose responsevariable has more than two categories is called a polytomous logistic regression model.

Premarital sexual behavior is a problem as well as a social phenomenon, which is increasinglycommon in society. The shift in the norms of right and wrong, good and bad, especially in thecontext of sexual behavior is becoming increasingly real. Among young people, premarital sex isincreasingly considered normative and is no longer taboo as it used to be. One form of premaritalsexual behavior is sex. Premarital sexual behavior among adolescents has a risk of unwanted pregnancy, the spread of sexually transmitted diseases such as HIV/AIDS, high rates of abortion andteenage marriage. Currently, adolescents are a potentially risky group and need serious attentionand sexuality is considered a major problem in the development of adolescent life.

Mimin Ria Jayati et. Al. (2019) stated that from a population of 100 adolescents at the Haji HealthVocational School in North Sumatra, there were quantitative research results, namely knowledge,exposure to information and the role of parents having an influence on adolescent sexual behaviorand factors that had no effect were the role of schools and health workers. The results of thequalitative research showed that the occurrence of risky adolescent sexual behavior in the HajjHealth Vocational School of North Sumatra [1]. Rani Elviyanti Siregar et. Al. (2020) statedthat out of 108 teenagers in Medan City, North Sumatra. By using a questionnaire as a basic datacollection tool and analysis of this study using crosstabulation analysis. So the results of this studyshow that 81.5% of adolescents admit that they are out of date, and 100% of adolescents admitthat they are out of date engaging in sexual activities (walking together, holding hands, kissing,hugging and having sex), and 62.0% teenagers live in boarding houses, and the above allowanceis IDR 500,000 per month [2].

From the studies that have been done, there are many things that affect premarital sexual behaviorin adolescents. So to understand the model of premarital sexual behavior and its significanceamong adolescents in the city of Medan, it is very important to promote its prevention. If therelationship can be known, then the steps taken can be more directed. Therefore, to determine themodel that influences premarital sexual behavior in adolescents in Medan City in 2021, logisticregression methods can be used. In this study, the response variable is premarital sexual behavioraged 15-19 years in Medan City, while the predictor variables that have been carried out in otherstudies include media, knowledge, attitudes and parental warfare.

RESEARCH METHOD

The data used in this study are primary data. According to Hasan (2002:82) primary data is data obtained or collected directly in the field by people who do research or who need it. Primary data can be obtained from respondent sources, such as individuals or individuals, such as the results of interviews conducted by researchers. The research was conducted in June-July 2021 with a research object, namely teenagers aged 15-19 in Medan City, North Sumatra. Data collection is carried out in the primary, which is by distributing questionnaires for teenagers aged 15-19 in Medan City. The population in this study is the number of teenagers aged 15-19 according to the statistics agency (BPS) in 2019 which was 216,669 teenagers.

RESULTS AND DISCUSSION
Validity Test
Validity test is used to measure the validity or validity of a questionnaire. A questionnaire is saidto be valid if the questions on the questionnaire are able to reveal something that will be measuredby the questionnaire. The significance test is carried out by comparing the calculated r value withthe r table for degree of freedom $(df) = n - 2 = 100 - 2 = 98$, in this case n is the number ofsamples and alpha = 0.05 so that the rtable value is 0.1966. If rcount is greater than rtable and thevalue is positive, then the item or question or indicator is.

Table 1. The results of the validity test of the Premarit al Sexual Behavior (Y) variable

Indicator	R-count	R-table	Description
1	0,502		Valid
2	0,662		Valid
3	0,749		Valid
4	0,887		Valid
5	0,943	0,1966	Valid
6	0,696		Valid
7	0,943		Valid
8	0,943		Valid
9	0,943		Valid
10	0,883		Valid

| 11 | 0,357 | 0,1966 | Valid |
| 12 | 0,357 | | Valid |

Based on the validity test in table above shows that all indicators on the Premarital Sexual Behavior (Y) variable are valid as measured by the R-count value greater than the R-table value (0.1966). The same way is done for the variables Media (X1), Attitude (X2), Knowledge (X3), Role of Parents. Based on the results of data processing with SPSS, it is obtained that each element of eachvariable is greater than r table (0.1966). This shows that the valid data.

Reliability Test

Reliability test is an instrument which, when used several times to measure the same object, will produce the same data [7]. SPSS provides facilities to measure reliability with the statistical testCronbach Alpha (α). A construct or variable is said to be reliable if it gives a Cronbach Alphavalue > 0.60. The following are the results of the reliability test.

Table 2. Reliability Test

Variables	R-Count	R-table	Description
Premarital Sexual Behavior(Y)	0,784		Reliable
Media(X_1)	0,692	0,60	Reliable
Attitude(X_2)	0,720		Reliable
Knowledge(X_3)	0,817		Reliable
Role Of Parents(X_4)	0,737		Reliable

Based on table above, the reliability test shows that the research variables have a good level ofreliability with Cronbach's Alpha value > 0.60, so it can be concluded that reliability is good.So, it can be continued with data processing through regression analysis by including all researchvariables.

The Feasibility Test of Variable

To determine the premarital sexual behavior model with binary logistic regression, an analysis of the form of the predictor variables will be carried out on the possible response variables. The fea- sibility test for the Media variable (X1) on premarital sexual behavior in adolescents is as follows:

Table 3. Variables in the Equation (X1)

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Media	-1.564	.548	8.143	1	.004	.209
	Constant	1.100	.723	2.314	1	.128	3.003

The same way is done for other variables. By using SPSS software to test the feasibility of each variable test of one variable, namely the media variable test (X_1), the attitude variable test (X_2), theknowledge variable test (X_3), the parental role variable test (X_4). The results of the feasibility test for one-on-one variables are as follows:

Table 4. Feasibility Test Results for each Variable

Variables	Wald	Sig	Significant
Media(X1)	8.143	.004	Significant
Attitude(X2)	9.385	.002	Significant
Knowledge(X3)	8.990	.003	Significant

The Role Of Parents(X4)	17.714	.000	Significant

The variable is said to be significant if the value of sig < α. In this study, the α used was 5%. Based on the table above, it can be seen that the value of sig < 0.05 in each variable. It states that each variable has a significant effect on the response variable (Y). The determination of the logistic regression model sought is between one predictor variable with a response variable, two predictor variables with a response variable, three predictor variables with a response variable and four predictor variables with a response variable.

Binary Logistic Regression Model of Premarital Sexual Behavior

At this stage, a logistic regression model for premarital sexual behavior was determined in adolescents Medan city in 2021. The logistic regression model sought is between one predictor variable with a response variable, two predictor variables with a response variable, three predictor variables with a response variable and four predictor variables with a response variable. Regression Logistic Model of Attitudes (X2) and the Role of Parents (X4) That Affect Premarital Sexual Behavior in Adolescents is.

1. Model fit test

Table 5. *Hosmer and Lemeshow Test* (X_1, X_2)

Step	Chi-square	df	Sig.
1	.405	2	.817

H_0: Model sesuai (p>$\alpha = 0,05$)
H_1: Model tidak sesuai
Pada tabel 4.17, diperoleh nilai x^2= 0,405 dan nilai p= 0,817 yang menyatakan bahwa model regresi logistik dari variabel media (X_1) dan sikap (X_2) telah cukup menjelaskan data (*goodness of fit*).

2. Test the significance of all parameters with the G test.

Table 6. *Omnibus Tests of Model Coefficients* (X_2, X_4)

		Chi-square	df	Sig.
Step 1	Step	23.625	2	.000
	Block	23.625	2	.000
	Model	23.625	2	.000

Based on table above, the value of the chi square model is 20,510 with degrees of freedom 2 and a significant value of 0.000 < 0.05 stating that the attitude variable (X2) and the role of parents (X4) simultaneously have a significant effect on the variable. premarital sexual behavior.

Tabel 7. *Model Summary*(X_2, X_4)

Step	-2 Log *likelihood*	Cox & Snell R Square	Nagelkerke R Square
1	93.026[a]	.210	.306

Based on table above, from two variables namely attitude (X2) and parental role (X4) thereis an estimated parameter (-2 log likelihood) of 93.026, the value of R2 is 0.210 or 21.0%(Cox & Snell) and 0.306 or 30.6% (Nagelkerke). In this case, $R^2 < 0.50$ indicates the loweffective contribution given by the two variables. So, these two variables are not enough tobe used as a model of premarital sexual behavior in Medan city teenagers in 2021

3. Test the parameters of each variable with the Wald test and determine the logistic regression model.

Table 8. Variables in the Equation (X2 ,X4)

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Sikap	.961	.534	3.234	1	.072	2.614
	Peran_Ortu	2.205	.628	12.344	1	.000	9.070
	Constant	-5.131	1.036	24.513	1	.000	.006

From table above, the following equations are obtained

$$g(x) = 0{,}961X_2 + 2{,}205X_4$$

$$\ln\left[\frac{p(x)}{1-p(x)}\right] = 0{,}961X_2 + 2{,}205X_4$$

$$\frac{p(x)}{1-p(x)} = \exp(0{,}961X_2 + 2{,}205X_4)$$

$$p(x) = \frac{\exp(0{,}961X_2 + 2{,}205X_4)}{1 + \exp(0{,}961X_2 + 2{,}205X_4)}$$

a. The odds ratio predicted by the model is Exp(B)
 1) Coefficient $X_2 = \exp(0{,}961) = 2{,}614$
 2) Coefficient$X_4 = \exp(2{,}205) = 9{,}070$
b. Logistic regression coefficient test with Wald test.
 1) Coefficient$X_2 = (\frac{\beta}{S.E})^2 = (\frac{0{,}961}{0{,}534})^2 = (1{,}799)^2 = 3{,}234$
 2) Coefficient$X_4 = (\frac{\beta}{S.E})^2 = (\frac{2{,}205}{0{,}628})^2 = (3{,}511)^2 = 12{,}344$

After testing the significance of the model, it can be seen in the results of the odds ratio if the attitude variable (X2) and the role of parents (X4) increases by 1 then premarital sexual behavior becomes Exp(B) times. In the acquisition of theWald test, there is an attitude variable (X2) which has a significant value of 0.072>0.05 and$W_k < X^2(\alpha, p)$so that H_0 is accepted,the attitude variable (X2) has no significant effect on behavioral variables. premarital sex in Medan City teenagers in 2021.

The model classification matrix
The model classification matrix is as follows

Table 9. Classification Table (X2 ,X4)

Observed	Predicted		Percentage Correct
	Behavior Sexual Premarital		
	Light	Heavy	

Step 1	Behavior sexsual Premarital	Light	68	5	93.2
		Heavy	14	13	48.1
	Overall Percentage				81.0

The predictive power of the logistic regression model with the media variable (X_1) and the attitude (X_2) to classify the observations is 76.0% of the 100 observations. 14 respondents (51.9%) predicted severe premarital sexual behavior out of a total of 27 respondents and 62 respondents (84.9%) predicted mild premarital sexual behavior out of a total of 73 respondents.

Logistic Regression Models

The resulting logistic regression models are as follows

Variables	Logistic Regression Models	G Test Value	R^2
X_1, X_2	$P(x) = \dfrac{\exp(-1{,}616X_1 + 1{,}520X_2)}{1 + \exp(-1{,}616X_1 + 1{,}520X_2)}$	97,262	0,256
X_1, X_3	$P(x) = \dfrac{\exp(-1{,}841X_1 + 1{,}905X_3)}{1 + \exp(-1{,}841X_1 + 1{,}905X_3)}$	96,142	0,269
X_1, X_4	$P(x) = \dfrac{\exp(-1{,}234X_1 + 2{,}301X_4)}{1 + \exp(-1{,}234X_1 + 2{,}301X_4)}$	91,432	0,324
X_2, X_3	$P(x) = \dfrac{\exp(1{,}485X_2 + 1{,}606X_3)}{1 + \exp(1{,}485X_2 + 1{,}606X_3)}$	98.380	0,243
X_2, X_4	$P(x) = \dfrac{\exp(0{,}961X_2 + 2{,}205X_4)}{1 + \exp(0{,}961X_2 + 2{,}205X_4)}$	93,026	0,306
X_3, X_4	$P(x) = \dfrac{\exp(1{,}209X_3 + 2{,}319X_4)}{1 + \exp(1{,}209X_3 + 2{,}319X_4)}$	92,279	0,314
X_1, X_2, X_3	$P(x) = \dfrac{\exp(-1{,}834X_1 + 1{,}501X_2 + 1{,}903X_3)}{1 + \exp(-1{,}834X_1 + 1{,}501X_2 + 1{,}903X_3)}$	87,833	0,364
X_1, X_2, X_4	$P(x) = \dfrac{\exp(-1{,}337X_1 + 1{,}072X_2 + 1{,}920X_4)}{1 + \exp(-1{,}337X_1 + 1{,}072X_2 + 1{,}920X_4)}$	87,703	0,365
X_2, X_3, X_4	$P(x) = \dfrac{\exp(1{,}019X_2 + 1{,}287X_3 + 1{,}972X_4)}{1 + \exp(1{,}019X_2 + 1{,}287X_3 + 1{,}972X_4)}$	88,868	0,352
X_1, X_3, X_4		86,140	0,382

	$P(x) = \dfrac{\exp(-1{,}462X_1 + 1{,}519X_3 + 2{,}012X_4)}{1 + \exp(-1{,}462X_1 + 1{,}519X_3 + 2{,}012X_4)}$		
X_1, X_2 ,X_3, X_4	$p(x) = \dfrac{\exp(-1{,}579X_1 + 1{,}156X_2 + 1{,}636X_3 + 1{,}624X_4)}{1 + \exp(-1{,}579X_1 + 1{,}156X_2 + 1{,}636X_3 + 1{,}624X_4)}$	82,074	0,425

Based table above a model of premarital sexual behavior in Medan City teenagers in 2021 wasobtained using binary logistic regression from the smallest G test value, namely $p(x) = \dfrac{\exp(-1{,}579X_1 + 1{,}156X_2 + 1{,}636X_3 + 1{,}624X_4)}{1 + \exp(-1{,}579X_1 + 1{,}156X_2 + 1{,}636X_3 + 1{,}624X_4)}$. The binary logistic regression method was used to determinethe model between premarital sexual behavior in Medan City adolescents in 2021 and thepredictor variables, namely media, attitudes, knowledge and parental roles were not optimal.

Conclusions

Based on the results and discussion, the following conclusions can be drawn a model of premaritalsexual behavior in Medan City teenagers in 2021 was obtained using binary logistic regressionfrom the smallest G test value, namely: $p(x) = \dfrac{\exp(-1{,}579X_1 + 1{,}156X_2 + 1{,}636X_3 + 1{,}624X_4)}{1 + \exp(-1{,}579X_1 + 1{,}156X_2 + 1{,}636X_3 + 1{,}624X_4)}$). Based onthe binary logistic regression modeling obtained, it can be seen that the entire value of Cox & Snelland Nagelkerke (R^2) <0.50 in the overall parameter significance test which states that the levelof effective contribution given by each predictor variable to the response variable is not sufficientto be used as a model. premarital sexual behavior in adolescents in Medan City in 2021. Thismeans that there are other variables besides media, knowledge, attitudes and parental roles thathave a significant relationship to premarital sexual behavior in adolescents in Medan City in 2021.So in this study, the binary logistic regression method was used to determine the model betweenpremarital sexual behavior in Medan City adolescents in 2021 and the predictor variables, namelymedia, attitudes, knowledge and parental roles were not optimal.

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