

# Application of the Rasch Model to the Development of Healthy Sexual Behavior Scale Indigenous Based on Students in Indonesia

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**Abstract—** Healthy sexual behavior plays an important role in the development of individual life. Indigenous-based healthy sexual behavior in this study contains Pancasila's values in it. Healthy sexual behavior can be accurately described in advance through a quality measuring instrument. This study focuses on developing a scale of healthy sexual behavior with an authentic approach of students using the Rasch model, assessment model that are seen as having advantages over classical theories. The research participants consist of 539 high school students. Based on the results of the analysis using the Winsteps program, it is known that there are 55 items (out of 60 items) that meet the item-accuracy index, with alpha coefficient 0.98, overall, it can be concluded that this healthy sexual scale has good psychometric properties so that it can be used for assessment and research.

**Keywords—** *healthy sexual behavior, indigenous approach, Rasch model*

## I. INTRODUCTION

Healthy sexual behavior is the ability of individuals to achieve well-being physically, psychologically, spiritually and socially related to sexuality, this is reflected in the expression that is free but responsible in their personal and social life. In this study, understanding the ability of healthy sexual behavior is all forms of heterosexual sexual acts, which are based on aspects: sexual identity, sexual orientation, and sexual behavior.

The Indonesian nation has a view of life, the philosophy of the nation, and the basis of the state which is a benchmark in making various rules, norms, ethical standards, standards of behavior in various aspects of national and state life that are distinct and different from other nations, namely the Pancasila. Thus Pancasila is an indigenous aspect of the Indonesian nation. Pancasila as the philosophy of life of the nation contains values that must be upheld in all aspects of life, including in terms of sexual behavior. Indigenous is a study of deep-rooted thinking, accustomed to everyday life, as ingrained in the community and culture [1]. In scientific indigenous psychology as the study of behaviors and mental processes of humans in cultural contexts that depend on values, concepts, belief systems, methodologies, and other

indigenous sources for certain cultural groups studied [2]. In practice, the standards of healthy sexual behavior that are used need to consider the context in which students grow and develop or in other words, indigenous sexual behavior. Indigenous is a formula to return adolescents to values, concepts, belief systems, methodologies, and views of life, national personality, and the highest legal foundation in Indonesia, namely Pancasila.

Define indigenous psychology the scientific study of human wisdom or mind that is native, that is not transported from other regions, and that is designed for its people (scientific studies of native or native human behavior or thoughts, which are not transported from other regions, and are designed for the community) [3]. Indigenous psychology emphasizes examining psychological phenomena in family, social, political, philosophical, historical, religious, cultural, and ecological contexts.

The special emphasis of cultural and indigenous psychology is the basis of ecology and contextual behavior in accordance with the contextual perspective of the development of counseling psychology [4,5], where development is seen as a process that is embedded in the family, school, society, and cannot be separated from this context [5]. Cultural and indigenous psychology advocates a complex, dynamic, and transactional model of human function where agency, meaning, purpose and purpose are seen as core aspects of human behavior.

Healthy sexual behavior is the ability of individuals to perform sexual acts that are heterosexual, which achieve prosperity, both physically, psychologically, spiritually and socially related to sexuality. Indigenous-based healthy sexual behavior in this study is defined as all sexual acts of individuals who achieve physical, psychological, spiritual and social well-being towards sexuality that has heterosexual identity, orientation and sexuality behavior based on Pancasila, while indigenous sexual unhealthy sexual behavior in this study defined as individual sexual, physical, psychological, spiritual and social sexual behavior towards sexuality that has homosexual identity, orientation and sexual behavior. In other words, indigenous sexual health behavior in this study is an act of heterosexual

sexuality that is healthy, physically, psychologically, socially, spiritually, which is related to heterosexual sexuality based on Pancasila.

In fact, not many studies have focused on developing measurement instruments for indigenous sexual-based healthy behavior. From the search results there are almost no forms of indigenous-based healthy sexual behavior instruments based on Pancasila's values. Healthy sexual scales are generally found but not on an indigenous basis. Therefore, research is needed that focuses on the development and renewal of related indigenous health-based sexual behavior instruments for high school students.

This study focuses on developing indigenous health-based sexual behavior measurement tools using the Rasch model. In this study, the authors developed a scale of indigenous sexual health-based behavior for high school students based on the dimensions of healthy sexual behavior and values in the five principles of the Pancasila.

Indigenous-based healthy sexual behavior is characterized by the acceptance of sexual identity, heterosexual orientation and behavior based on Pancasila with a starting point on physical, psychological, spiritual and social aspects.

Measurements in the study of psychology 95% are still being developed based on the Classical Test Theory (CTT) approach. On the one hand, so far most of the psychological measurement tools are still being developed with CTT, but on the other hand, there have been many criticisms aimed at this approach [6]. The power of discrimination and the degree of difficulty of items depends on the sample, the apparent score and pure score depends on the test, especially on the difficulty level of the test, and the equivalent measurement error for all respondents [7]. The types of data obtained through measurement techniques that ask for opinions or attitudes are nominal and ordinal so that the analytical tools that can be used are limited [8]. Even this classic test theory approach was then corrected with the emergence of an Item Response Theory/IRT). One approach model in the IRT is the Rasch model.

The advantages of Rasch modeling compared to other methods, especially the classical test theory, are namely the ability to predict the missing data, based on individual response patterns [9]. This advantage makes the results of the Rasch model statistical analysis more accurate in the research conducted, and more importantly, Rasch modeling is able to produce standard error measurement values for the instruments used that can improve the accuracy of calculations. Calibration is done in Rasch modeling simultaneously in three ways, namely the measurement scale, the respondent, and the items. An instrument that is not calibrated then has the possibility of producing invalid data and can cause research activities carried out to fail. stated that the use of the Rasch model in instrument validation will produce more holistic information about the instrument and better meet the definition of measurement [10]. Therefore, this study also uses Rasch modeling in the analysis of the data.

The aim of this study was to develop a scale-based Healthy Sexual Behavior Scale in students using the Rasch model. The results of the study are measuring instruments

that have good quality so that they can be used to obtain accurate information about students' healthy sexual behavior. This is very useful for students themselves as a form of self-evaluation and reflection, as well as psychologists, especially Guidance and Counseling teachers in schools in providing assistance and self-development for students.

## II. METHODS

The participants of this study were high school students from various major cities in Indonesia. The total number of participants was 539 people, aged 15-17 years. All participants participated voluntarily in filling out the instrument.

There are several stages in the research development of this measuring instrument, namely: first, identification of measurement objectives (theoretical extraction determination). The extract revealed is a healthy sexual behavior based on indigenous values of Pancasila. Second, formulate behavioral aspects and behavioral indicators as outlined in the blueprint. The indigenous-based healthy sexual behavior scale is based on aspects or dimensions of healthy sexual behavior and the dimensions of Pancasila values.

The scaling method used in this scale is the summated ratings (Likert) method with six response options, namely SS (Strongly Agree), S (Agree), CS (Slightly Agree), KS (Slightly Disagree), TS (Disagree), and STS (Strongly Disagree). The author makes 60 items according to the blueprint that has been made before. Item form is a statement with six response choices.

Review items, carried out both in terms of language and content by professional judgments. This item review aims to see the suitability of items that has been written with the aspects revealed and the suitability of the language used. This process is done so that the scale created has good content validity. The item review process was carried out by three experts in counseling and guidance who had experience in assisting healthy sexual behavior in high school students. As a result, the overall item is deemed to be in accordance with the objective of measurement by the assessors, but there are some items that need to be slightly revised to be more easily understood by respondents. From this process, the author made several editorial improvements according to the recommendations of the assessor. The prepared scale was tested on 539 high school students to respond.

Data analysis was performed using the Rasch model approach through the Winsteps program. In the Rasch model approach, in addition to paying attention to the item, it also pays attention to the respondent aspects and calculates the correlation amount. The analysis results displayed are summary statistics, item accuracy index, respondent accuracy index, unidimensionality, and rating scale.

## III. RESULT AND DISCUSSION

### *Result*

Person and item reliability results and Cronbach's alpha (item-person interaction) must be greater than 0.67.

Based on the results of the Rasch model analysis, it is known that item reliability and Cronbach's alpha (item-person interaction) are 0.98, greater than the minimum criteria of 0.67. So you can say that the reliability of item-person interactions is very good [9].

*Separation* of item-person must be greater than 3, meaning to present a sample, but if it is smaller than 3 it means there is a mistake or inaccuracy in choosing a sample. Based on the results of the Rasch model analysis, it is known that the *separation of item-person* is equal to 3.84 than the minimum criteria of 3.00. Then it can be said that this grouping of respondents presents a sample, or there is no mistake or inaccuracy in choosing a sample. The research sample represented the group.

Table 1. The summary of measured person

Summary of 539 Measured Person								
	Total Score	Count	Measure	Model Error	Infit		Outfit	
					MNSQ	ZSTD	MNSQ	ZSTD
Mean	311.1	60.0	1.95	.24	1.24	.1	1.21	.0
S.D	40.0	.0	1.39	.17	.95	3.1	1.04	2.9
Max	359.0	60.0	5.73	1.01	5.39	9.9	9.90	9.8
Min	105.0	60.0	-1.46	.10	.15	-6.5	.19	-6.2
Real RMSE : .35		True SD: 1.34		Separation: 3.84		Person Reliability: .94		
Model RMSE : .29		True SD: 1.36		Separation: 4.62		Person Reliability: .96		
S.E. of Person Mean=.06								

Table 2. The summary of measured person

Summary of Measured Person								
	Total Score	Count	Measure	Model Error	Infit		Outfit	
					MNSQ	ZSTD	MNSQ	ZSTD
Mean	2794.3	539.0	.00	.06	1.07	.3	1.21	.8
S.D	156.9	.0	.56	.01	.38	4.0	.67	4.1
Max	3131.0	539.0	1.06	.11	2.22	9.9	3.26	9.9
Min	2387.0	539.0	-1.75	.04	.61	-5.7	.54	-5.4
Real RMSE : .07		True SD: .55		Separation: 8.28		Person Reliability: .99		
Model RMSE : .06		True SD: .55		Separation: 9.16		Person Reliability: .99		
S.E. of Person Mean=.07								

The result of validity is an argument, not a number, but it supports the processing of numbers related to the *measure* column is an *outlier* item, not measuring, too easy or too difficult. Then it is stated in the criteria  $-2.0 < ZSTD < 2.00$ . While SE is stated in the criteria:  $< 0.50$ , meaning very thorough or good,  $0.51 - 1.00$  means good, and  $> 1.0$  means that it is not accurate or not good.

According to Boone, Staver, & Yale (2014)  $MNSQ < 0.5$ ,  $ZSTD < 1.5$ ,  $ZSTD < 2.0$ , and  $POINT MEASURE CORR. > 0.4$ . Negative correlation means that items cannot be correctly perceived by respondents, poor misfit or *content validity*.

Based on the recapitulation table and the interpretation of the results of the test instruments above, it is known that in general, all items (60) were positively perceived by respondents. This means that respondents are not mistaken in interpreting each item they do. This is indicated by the results of the *point correlation* which is positive (+) all. Because the respondents tested the sample above 300 people, then for ZSTD OUTFIT criteria it was ignored because theoretically it would always produce numbers above 3.00. A total of 55 items meet the minimum criteria, where the *point correlation* index (Pt. Corr) is above 0.40 so that it can be directly used (P) as a valid instrument, while as many as 5 (five) items do not meet the minimum criteria (below 0.40), namely items number 1, 2, 3, 7, and 51 so that it requires revisions from the editorial side. The results of processing the Rasch model analysis, obtained *raw variance explained by empirical* measures of 47.3%. These results meet the minimum criteria where the results of raw variance explained by empirical measures must be greater than 20%. This means that the items developed in this instrument measure the same thing, one thing, or one variable, with an empirical *Unexplained variance* in 1st contrast of 3.9% with the minimum criteria that must be met is that it must be less than  $< 15\%$ .

Table 3. The results of the Rasch model analysis items tested

No	Description	Mean	Standard Deviation	Separation	Reliability	Alpha Cronbach (α)
1.	Person	1,95	1,39	3,84	0,94	0,98
2.	Item	0,00	0,56	8,28	0,99	

Based on the results of the analysis using the Rasch model various information was obtained, both in terms of items and respondents who were participants in the scale trials (person). In this study, data analysis was carried out several times until a number of items were obtained that met the item-accuracy index. According to [11], the parameters used to determine the accuracy or suitability of respondents include: first, the received *outfit mean square* (MNSQ) value:  $0.5 < MNSQ < 1.5$ . Second, the *outfit Z-standard* (ZSTD) received value:  $-2.0 < ZSTD < +2.0$ . Third, the *point measure correlation* value (Pt Mean Corr) is accepted:  $0.4 < Pt Measure Corr < 0.85$ . Values that are outside the criteria limit indicate a response pattern that needs to be identified further. After looking at the scalogram, we found that 539 people had a consistent and reasonable response pattern.

Based on the results of the analysis using the Rasch model, various information was obtained, both in terms of items and respondents who were participants in the scale trials (person). In this study, a number of items were found that met the item-model accuracy index. In the first phase of the analysis, 539 respondents were identified correctly with the model. According to Boone, Staver, & Yale (2014), the parameters used to determine the accuracy or suitability of respondents include: first, the received *outfit mean square* (MNSQ) value:  $0.5 < MNSQ < 1.5$ . Second, the *outfit Z-standard* (ZSTD) received value:  $-2.0 < ZSTD < +2.0$ . Third, the *point measure correlation* value (Pt Mean Corr) is accepted:  $0.4 < Pt Measure Corr < 0.85$ .

At the analysis stage to find out items that are not appropriate or not appropriate to the model. The criteria used to check item suitability are the same as the criteria for respondent accuracy, namely the *mean square outfit*, *z-standard outfit*, and *point measure correlation* values [11]. Items that are less precise with the model are then eliminated or excluded from the analysis process. Analysis stops when no more items are indicated that have low model accuracy (misfit). In the end, at the fifth analysis stage, there were no more items identified that were not right with the model so that the total items that met the accuracy index of the items amounted to 55 items. The results of the final analysis of an indigenous-based healthy sexual behavior scale in the collection contained 55 items with a total of 539 students. Overall, the results of the analysis of the items and respondents indicate that no item was missed to be answered by the respondent or all respondents filled the whole item in full.

The item reliability value of 0.91 indicates that the quality of items in this instrument is high. In other words, the sixty that were identified as having accuracy with the model were indeed quality items. Furthermore, the respondent's reliability value of 0.91 indicates that the consistency of the answers from respondents is high. In other words, respondents answered the whole item seriously (not carelessly).

Based on the results of analysis by Rasch modeling, it is known that the scale of indigenous-based healthy sexual behavior provides consistent and proven results that reveal a psychological construct (unidimensional), namely indigenous sexual health based behavior. Of the 60 items analyzed there were 55 items that fit the model, with alpha reliability coefficients of 0.94. This alpha value is a measure of reliability which in practice measures in the form of interactions between respondents and items as a whole. The results of the alpha reliability coefficient of 0.94 indicate that the scale of indigenous healthy sexual behavior has a high reliability coefficient. That is, this scale produces a measurement score that is consistent and reliable. The item reliability coefficient and the respondents were classified as good, namely 0.94 and 0.96. This shows that the 55 items are quality items and the group of respondents answered seriously. Both of these results further strengthen and confirm that the scale of indigenous sexual-based healthy behavior is indeed a quality measuring tool because not only are measurement results reliable, but also quality items.

#### IV. CONCLUSION

Based on the interpretations made above, it can be decided that the 60 items developed in the study can be used to collect further research data, if the five items recommended for revision have been carried out. The instrument used has special reliability criteria and only measures one thing or one research variable with good criteria.

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