Adaptation of Validity and Reliability of Indonesian Instruments of Attitudes Toward Suicide with The Rasch Model Approach

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Abstract

Background: Indonesia has a suicide rate that continues to increase so suicide attempts need to be made. One of the early prevention steps is to find suicidal ideation. ATTS is a multi-dimensional measuring tool by measuring Cognitive, Affective and Behavioral aspects that is easy to fill, fast and precise in measuring attitudes towards suicide in the general population through large surveys than other instruments and ATTS is also not yet developed in Indonesia. Therefore, with the Rasch Model that can perform analysis at the item and respondent level, it is expected to produce a psychometric tool in preventing suicide in Indonesia.
Purpose: The purpose of this study is to test the validity and reliability of the adaptation of the Attitudes Toward Suicide (ATTS) instrument into Indonesian using the RASCH model approach.
Methods: The method used is non-experimental with an analytical observational approach which is carried out cross-sectionally using the RASCH model with winstep software. The number of samples used was 243 residents with inclusion criteria of being adults (20-40 years) and knowing about suicide cases in Plered District, one of the sub-districts in Purwakarta Regency which had several suicide cases in 2020. This instrument consists of 73 questions.
Results: The results showed a value of scale-level (S-CVI) = 0.89 and content validity ratio (S-CVR/UA) = 0.72. This value indicates a good quality of content validity. Analysis based on RASCH shows very good item reliability with a value of 0.98 but the result of person reliability is 0.27 which is caused by the lack of variation in respondents' answers in filling out the questionnaire. This also has an impact on Cronbach's alpha value = 0.32. The analysis is elaborated into four factors consisting of summary statistics, unidimensionality, item size, and Differential Item Functioning (DIF). The results show ideal results, but the pattern of person responses that are not diverse from the respondents causes a logit distribution that is not too far away and the variance is not large.
Conclusion: it can be concluded that the consistency of respondents' answers is weak but the quality of the instrument questions in terms of reliability is good and can still be used to measure ATTS.

Keywords: Attitudes Toward Suicide (ATTS); Indonesian; rasch model; reliability; validity.

Introduction

Suicidal behavior is widely known to be a problem that occurs in society (Cwik et al., 2017). Suicide is a behavior carried out by someone where he considers suicide as the best solution to solve the problem at hand. More than that, suicide is death due to an act committed against oneself with the purpose of life and specifically this death is caused by injury, poisoning, or death in a helpless state committed by a person. (Nock et al., 2008).

Data from the World Health Organization (WHO) in 2017 states that every year, as many as 800,000 people die from suicide, or every 40 seconds, there is one person who dies by suicide. Indonesia as a middle-

Jurnal Keperawatan Padjadjaran (JKP)

Volume 10(1), 66-72

https://doi.org/10.24198/jkp.v10i1.1714

Article Info

Received : September 20, 2021
Revised : April 27, 2022
Accepted : April 29, 2022
Published : April 30, 2022

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Citation

Marpatmawati, I., Suryani, S., & Widianti, E. (2022). Adaptation of Validity and Reliability of Indonesian Instruments of Attitudes Toward Suicide (Atts) with The Rasch Model Approach. *Jurnal Keperawatan Padjadjaran, 10*(1), 66–72. https://doi.org/10.24198/jkp.v10i1.1714

Website

http://jkp.fkep.unpad.ac.id/index.php/jkp

E-ISSN: 2442-7276
P-ISSN: 2338-5324

income country has a suicide rate that tends to increase. The suicide rate in Indonesia was around 4.3% of the 100,000 population, while in 2015 it increased to 4.5% of the 100,000 population. So, the data shows that there are around 9105 suicides every year (WHO Region, 2014). A preliminary study conducted by researchers with members of the Criminal Investigation Unit of the Plered Police stated that in 2020, there were 4 cases of suicide in the Plered Police area.

Suicide cases recorded in Indonesia to date represent only a small fraction of the actual suicide cases and if there are no concerted prevention efforts, this number could increase from year to year. It is necessary to prevent suicide attempts. Suicidal ideation, threats and attempts at suicide require a high priority and are serious things to do (Townsend, 2011). One of the early prevention steps that can be done is to find suicidal ideation. A person should be asked directly about suicidal thoughts, where the question makes them feel cared for and gives them the opportunity to express their problems (Stuart, 2016).

Based on the literature conducted by researchers, various instruments have been developed and validated to measure attitudes towards suicide including the Beck Scale for Suicide Ideation, Suicide Attitude Questionnare (SUIATT), Suicide Opinion Questionnaire (SOQ) and Attitudes Toward Suicide (ATTS) (Renberg et al., 2008) When compared with the three measuring tools that the authors describe, only the ATTS and SOQ measuring tools can be used in the general population, because the SUIATT and BSSI can only be used by professional clinical settings so that it requires the development of a measuring scale in the form of a simpler scale if used in the general population and on a large scale. Like the ATTS, although the SOQ can be used in the general population, the SOQ has 100 question items and 7 additional question items so it is considered too much if used in large survey studies, so that only ATTS, as a multi-dimensional measuring tool that can measure Cognitive, Affective aspects, and Behavior, is suitable for measuring attitudes toward suicide in the general population through a large questionnaire survey (Stecz, 2021).

Attitudes Toward Suicide (ATTS) is the newest instrument in 2003 which was developed in Sweden by Renberg & Jacobsson to the Swedish community. In addition, ATTS is a measure of attitudes towards suicide that has never been developed in Indonesia. So based on the explanation above, researchers are interested in conducting research on the validity and reliability of Attitudes Toward Suicide (ATTS) in the Indonesian version of the adult community.

Methods

Study Design

This research is quantitative research with a non-experimental method. The approach used was observational analytic, carried out cross-sectionally using the RASCH model approach in the data analysis to test the validity and reliability of the Indonesian version of Attitudes Toward Suicide (ATTS).

Setting and sample

The population in this study was 77,357 residents with 243 samples selected using the cluster random sampling method. The samples were residents of Plered sub-district with inclusion criteria of adult (age 20-40 years) and knowing about suicide cases in Plered sub-district.

Instrument

The research instrument used was Attitudes Toward Suicide (ATTS). This instrument is a questionnaire used to measure attitudes towards suicide.

Procedure

The first step in this research was to request permission and approval from the copyright owner of the Attitudes Toward Suicide (ATTS) instrument, namely Prof. Ellinor Salander Renberg. Then, researcher submitted ethical clearance to the Research Ethics Committee of the Faculty of Medicine, Padjadjaran University.

The researcher also applied for a research permit to the UPTD of the Plered Health Center. After the letter of ethics was received, the researcher carried out the translation stage. At the expert panel stage, three people were present. The expert panel consisted of psychologists and psychiatrists with experience in instrument development and translation. The research process was carried out by researcher and assisted by a nurse who held a mental health program at the Plered Health Center and 16 mental health cadres taken from each village in the Plered sub-district.

The data collection process began with providing an explanation to the respondent before giving informed consent, regarding the research objectives via telephone/whatsapp. Respondents who were willing to participate in this study would fill out a willingness to become a respondent form and filled it out without coercion from other parties using the Google form.

In the initial translation stage, the English version of the Attitudes Toward Suicide (ATTS) instrument would be translated into Indonesian. Furthermore, at the expert panel stage, three experts attended. The expert panel consisted of psychology and psychiatric experts with experience in instrument development and translation, namely dr. Selly Iskandar, Sp.AKP., Sp.KJ., M.Si., Ph.D; Aat Sriati, S.Kp., M.Si; Dr. Ahmad Gimmy Prathama Siswadi, M.Sc. This expert panel discussed the original version of the instrument. Based on the results of the expert assessment, there were 9 questions that were omitted because these questions were related to euthanasia, while the concept of suicide was different from euthanasia.

Several questions were omitted based on expert advice, namely questions that had a CVI value > 0.8 and a CVR value that had a range of values from +1 to -1. The CVI value for each statement item was determined based on expert judgment with a range of 1 (irrelevant) – 2 (somewhat relevant) – 3 (relevant) – 4 (very relevant). While the CVR assessment was determined based on an assessment with a range of items 1 (not essential), 2 (important but not essential), and 3 (essential). CVR was calculated by counting the number of experts who gave a score of "3" (essential) minus (N/2) divided (N/2). From the results of the assessment above, the results of the expert panel that had been carried out in this study showed the value of S-CVI = 0.89 and S-62 CVR/UA 0.72. This value indicated a good quality of content validity.

Data Analysis

The data analysis stage in this study was carried out using computer software, with a RASCH model analysis approach to see the interaction between people and statement items. Researchers measured 4 things, namely summary statistics to measure the overall quality of the respondents and the quality of the instruments used, as well as the interaction between the person and the question items. Unidimensionality is the most important measure to evaluate whether an instrument should be developed or measure what should be measured. Measured items to determine the level of suitability of the initial item and Differential Item Functioning (DIF) Instruments could be identified based on the probability value of the item being below 5% (0.05).

Ethical Clearance

This research had received ethical approval from the Research Ethics Committee of the Faculty of Medicine, Padjadjaran University and received research permission on April 2, 2021 with letter number 253/UN6.KEP/EC/2021.

Results

The analysis in this study is elaborated into four, consisting of summary statistics, unidimensionality, item measure, and Differential Item Functioning (DIF). The summary statistics are used to measure the overall quality of respondents and the quality of the instruments, as well as interactions between people and items. Unidimensionality is the most important measure to evaluate whether the developed instrument is able to measure what it is supposed to measure. Items are measured to determine the level of suitability of the initial items. Meanwhile, Differential Item Functioning (DIF) can be used to detect bias on items in certain respondent categories or no.

Summary Statistic

Summary statistic is used for measuring Cronbach's alpha values, person reliability and item reliability, separation, infit and outfit.

Based on the table 1 above, the results of the RASCH analysis in the statistical summary of person measure = -0.32 logit show the average number of respondents' answers in answering the questions given. This result means that the value is smaller than the logit item (0.0) which shows the tendency of the respondent's ability to be smaller than the level of difficulty of the question instrument. The standard deviation of person = 0.24 shows that the distribution of the respondent's logit is not that far away because the variation in answers does not vary, this has an impact on the reliability value of the person 0.27 (minimum 0.6) and the separation value 0.62 (minimum 2).

However, the logit item measure = 0.0 with SD = 2.68 shows that the logit item variance is very ideal. Rhus, the implication is that the item reliability value is very good = 0.98 and separation = 7.88. This shows that the instrument has a good measurement quality from the aspect of the distribution of logit items. The value of person reliability is 0.27 and item reliability is 0.98. It can be concluded that the consistency of respondents' answers is weak, but the quality of the instrument questions in terms of reliability is good.

The MNSQ Infit and Outfit values or the suitability of the data with the model, both for persons and items are within the ideal value, namely = 1.00 (accepted range = 0.5 – 1.5), as well as for the ZSTD Infit and Outfit value which is very close to the

Tabel 1. Summary Statistic

	SD	α	Measure	Separation	Reliability	Infit		Outfit	
						MNSQ	ZSTD	MNSQ	ZSTD
Person	0.24	0.32	-0.32	0.62	0.27	1.00	0.00	1.00	0.00
Item	2.68		0.00	7.88	0.98	1.00	-0.20	1.01	-0.12

Tabel 2. Unidimensionality

	Emperical
Raw varience explained by measure	69.8%
The raw first unexplained varience contrast	1.9%

ideal value 0 (range which is accepted is -2 to +2). This shows that the overall person and item data can be analyzed using the RASCH model, because the accuracy of the data and the index model shows that it is close to the ideal value. Cronbach's alpha value = 0.32 (minimum value of 0.6) indicates a lack of reliability.

The variation in the pattern of person responses in this study came from the respondents, while the instrument was not problematic. The diversity of person response patterns, among others, is caused by the type of questions given that do not cause various answers or because the rating choices are limited.

Unidimensionality

Unidimensionality is the most important measure to evaluate whether the developed instrument is able to measure what is supposed to be measured.

The table 2 above shows that the Raw variance explained by measure (unidimensional) has a value of 69.8% where the minimum value = 20%, above 40% is considered better, and above 60% is very good. This shows that the value above has a good construct validity value, the items can measure the level of difficulty from low to high levels. The value of unexplained variance = 1.9% where the value should be less than 15%. This shows that noise or measurement interference can be reduced to a minimum so that it does not interfere with the quality of the measurement.

Item Measure

The measure column indicates how many respondents (243) and items (73) were evaluated. The higher the measure value (logit value = 0.0) then the question item is more difficult to approve and vice versa, the smaller the measure value of 0.0 logit, the easier the item is approved.

Based on the results of the analysis, items numbered 1 and 8 are the most difficult items to be approved by the respondents and items no. 25, 21, 20, 19, 13 are items that are difficult to agree on. Items 1 and 8 contain "Has your family ever attempted suicide" and "Many suicide attempts were made because of revenge or to punish others" because none of the respondents had a father or sister who had ever attempted suicide. While items no. 25, 21, 20, 19, 13 which are easily agreed upon items contain "Suicide is never justified", "most people avoid talking about suicide", "I can say that I don't really want to kill myself", "I am ready to help someone who is in a suicide crisis by contacting them", "suicide is preventable". Easy-to-approve items, meaning the items with the lowest logit values, where most of the respondents answered agree and strongly agree. While the items that are difficult to agree on are items with a large logit value, meaning that more respondents answered disagree and strongly disagree.

Differential Item Functioning (DIF)

Items and measurement instruments can be biased, when items favor one individual with certain characteristic (Sumintono & Widhiarso, 2014). DIF in RASCH is used to detect measurement bias. The DIF threshold is 0.05. on the results of data management, the probability value of items above 0.05 indicates that there is no measurement bias. The use of the RASCH model properly can help to avoid ambiguous instruments or are not well understood by respondents (Mokshein et al., 2019). In this study, the community, both males and females, did not have a significant difference in attitude because the probability value of all items was > 0.05. This shows that the ATTS instrument that measures attitudes towards suicide can measure well in both men and women in society without any measurement bias.

Discussion

Reliability is used to assess the consistency of the instrument in assessing respondents. The results of personal reliability data analysis are almost the same as the results of data analysis from classical theory (eg, KR 20 and Cronbach's alpha). If the person reliability is close to 1, the instrument has better consistency in measurement (Klein et al., 2011). In RASCH, it is necessary to understand separation (person and item), person separation is used to classify people and item separation is used to verify the hierarchy of items.

A low person means that the instrument is not sensitive enough to distinguish people who have good and low performance, the solution given is to add items to the instrument while a low item separation indicates that the sample of people used is not sufficient to confirm the hierarchy of difficulty items (construct validity). Separation value is 0 to infinity, the higher the value of separation, the better the measurement (Boone et al., 2014).

Attitudes are considered as an important part of a person's personality and can often predict a person's behavior (Poreddi et al., 2016). Thus, measuring individual attitudes toward suicide is the first step in preventing suicide (Renberg et al., 2008). Based on the results of the RASCH analysis in the statistical summary, person measure = -0.32 logit shows the average number of respondents' answers in answering the questions given. This result means that the value is smaller than the logit item (0.0) which shows the tendency of the respondent's ability to be smaller than the level of difficulty of the question instrument. The standard deviation of person = 0.24 indicates that the distribution of the respondent's logit is not that far where the variance is not large. This has an impact on the reliability value of the person 0.27 (preferably above 0.6) and the separation value of 0.62 (at least 2).

However, the mean logit item = 0.0 with SD = 2.68 where the ideal logit mean = 0.0 and the ideal SD > 1 which indicates that the logit item

variance is very ideal. This has implications for a very good item reliability value = 0.98 and a good separation of 7.88. This shows that the instrument has a good measurement quality from the aspect of the distribution of logit items. So, from the value of person reliability 0.27 and item reliability 0.98, it can be concluded that the consistency of the respondents' answers is weak but the quality of the instrument questions in the reliability aspect is good. The MNSQ Infit and Outfit values or in terms of the suitability of the data with the model, both for persons and items are within the ideal value, namely = 1.00 (accepted range 0.5 – 1.5), as well as for the ZSTD Infit and Outfit value which is very close to the ideal value of 0, (and the accepted range is -2 to +2). This shows that the overall person and item data can be analyzed using the RASCH model, because the accuracy of the data and the index model shows that it is close to the ideal value. Cronbach's alpha value = 0.32 (minimum value of 0.6) indicates a lack of reliability.

The variation in the pattern of person responses in this study came from the respondents, while the instrument was not problematic. The diversity of person response patterns, among others, is caused by the type of questions given that do not cause various answers or because the rating choices are limited. Unidimensionality plays an important role explicitly and implicitly during the item construct process. Unidimensionality is the basis and critical assumption of measurement theory. The measurement of unidimensionality is a prerequisite for reliability analysis (Mokshein et al., 2019)

Unidimensionality is an important measure to evaluate whether the instrument is able to measure what it is supposed to measure, in this case the ATTS construct. The analysis of the RASCH model uses principal component analysis of the residuals, which is to measure the extent to which the variance of the instrument measures what it is supposed to measure. Identification of measurement dimensionality is useful for optimizing the measurements made so that the information provided is more focused on the attributes being measured (Sumintono & Widhiarso, 2014).

The value of raw variance explained by measure should not be less than 40% and the percentage of empirical value should be almost the same as the modeled. The raw first unexplained varience contrast should not exceed 15%, the second unexplained variance contrast should not exceed the first unexplained contrast. Based on the results of the RASCH analysis on the ATTS instrument, the value of Raw variance explained by measure (unidimensional) has a value of 69.8% where the minimum value = 20%, above 40% is considered better, and above 60% is very good. This shows that the value above has a good construct validity value, the items can measure the level of difficulty from low to high levels.

The value of unexplained variance = 1.9% where the value should be less than 15%. This shows that noise or measurement interference can be reduced to a minimum so that it does not interfere with the quality of the measurement. The measurement evaluation process in the instrument is repeated to get the right composition. Instruments can be said to be good if they have various levels of difficulty. The diversity of item difficulty levels aims to measure the various abilities of people who come from different levels of the spectrum (Sumintono & Widhiarso, 2014).

The measure column indicates how many respondents (243) and items (73) were evaluated. The higher the measure, the more difficult the statement items to approve. Based on the results of the analysis, items numbered 1 and 8 are the most difficult items to be approved by the respondents and items no. 25, 21, 20, 19, 13 are items that are difficult to agree on. Items 1 and 8 contain "Has your family ever attempted suicide" and "Many suicide attempts were made because of revenge or to punish others" because none of the respondents had a father or sister who had ever attempted suicide.

While items no. 25, 21, 20, 19, 13 which are easily agreed upon items contain "Suicide is never justified", "most people avoid talking about suicide", "I can say that I don't really want to kill myself", "I am ready to help someone who is in a suicide crisis by contacting them", "suicide is preventable". Easy-to-approve items, meaning the items with the lowest logit values, where most of the respondents answered agree and strongly agree. While the items that are difficult to agree on are items with a large logit value, meaning that more respondents answered disagree and strongly disagree.

The views of the Indonesian people towards suicide with 101 research subjects consisted of 44 men and 57 women who are adherents of 6 religions in Indonesia who have in-depth knowledge about their religion. The study showed as many as 98 respondents answered that suicide was a sinful act and the other 3 respondents answered that they did not know or hesitated. This is in line with the results of the study which showed that all respondents did not condone suicide. Indonesia has a collectivism culture which means showing the state of society where each member is integrated into strong and integrated group ties throughout their life span to protect each other. In countries with a high level of collectivism, individuals have concern for other individuals in the group and expect others to care for themselves in a reciprocal manner (Pratiwi, 2020).

Items and measurement instruments can be biased, when items favor one individual with certain characteristics (Sumintono & Widhiarso, 2014). DIF in RASCH is used to detect measurement bias. The DIF threshold is 0.05.Oon the results of data management, the probability value of items above 0.05 indicates that there is no measurement bias. The use of the RASCH model properly can help to avoid ambiguous instruments or are not

well understood by respondents (Mokshein et al., 2019). In this study, the community, both males and females, did not have a significant difference in attitude because the probability value of all items was >0.05. This shows that the ATTS instrument that measures attitudes towards suicide can measure well in both men and women in society without any measurement bias.

Conclusion

The ATTS instrument adapted from Indonesian has tested the validity and reliability of the (ATTS) instrument into Indonesian using the RASCH model approach. The research design uses quantitative with non-experimental method showing the results of an S-CVI = 0.89 and an S-CVR/UA 0.72. This value indicates a good quality of content validity. The analysis in this study is divided into four factors consisting of summary statistics, unidimensionality, grain size, and Differential Item Functioning (DIF). The results of the four psychometric attributes of the instrument show ideal results, but the response pattern of people who are not diverse from the respondents causes the logit distribution that is not too far and the variance is not large.

Analysis based on RASCH shows the reliability of the item is very good with a value of 0.98 but the result of the reliability of the person is 0.27. This also has an impact on Cronbach's alpha value = 0.32 so that it can guarantee that the respondents' answers are weak but the quality of the instrument in terms of reliability is good and can still be used to measure attitudes towards suicide. The weak results of Cronbach's alpha and person reliability in this study were caused by the lack of variation in respondents' answers to the questionnaire items.

The ATTS exploratory factor analysis conducted in Renberg and Jacobsson's (2003) research also showed that the preparedness to prevent factor showed the lowest Cronbach's alpha value of 0.38, resulting in an overall Cronbach's alpha value accumulation of 0.60. Renberg and Jacobson (2003) in their research on instrument testing assume that the value of some items of ATTS reliability is low because this instrument measures a broad attitude that can lead to ambiguity, and is given to a heterogeneous group of people, thus requiring additional studies including repeatability measurements. In addition, the attitude change factor is not completely stable from time to time so that it can affect the instrument's reliability value (Inagaki & Yamada, n.d.).

The ATTS instrument does not cover Indonesian local culture and does not cover the typical signs and symptoms of suicide such as ambivalence, sadness, hopelessness, and self-harm.

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