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Development of Disability Inclusion Capacity Instrument for Community Cadres: Rasch Model Analysis

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Abstract

Adding to their relatively high number, people with disabilities in Indonesia also face various challenges. Given such high prevalence, cadres have an important role in promoting disability inclusion. It is crucial to measure the level of knowledge, attitudes, and behaviors of these cadres regarding disability inclusion, for example, by using an instrument. To test the validity and reliability of such an instrument, statistical analysis methods like the Rasch Model Analysis are applicable due to their advantages. This study evaluates the construct validity of the Hilfi & Kaylia Disability Inclusiveness Perception instrument among health cadres. The study used a cross-sectional design using secondary data from the Disability Inclusion Capacity instrument administered to 709 cadres residing in Bandung City, Indonesia, from July to December 2024. Construct validity was analyzed using the Rasch model. Data from 626 participants who met the criteria showed that the average outfit mean-square (MnSq) for the 25-item version of the instrument met Rasch model expectations (0.92). However, item J1 was identified as a misfitting item (outfit MnSq > 1.4 and outfit Z-standard (ZSTD) > 2) across all three versions of the instrument. The explained variance was found to be 44.1%. Reliability and separation index results were excellent, with Cronbach's alpha at 0.96 and separation index above 2. However, category response functioning and targeting did not fully meet Rasch model expectations. Nonetheless, it can be concluded that the Hilfi & Kaylia Disability Inclusiveness Perception Instrument has acceptable construct validity with the sample of health cadres in Bandung City, Indonesia.

A. Introduction

Impairment is a loss or abnormality in the form of physiological, psychological, or anatomical structure or function that can be temporary or permanent. Someone who has an impairment can experience limitations in carrying out activities in their life. The term used for this is disability (Linden, 2017). According to Article 1 Paragraph 1 of Act No. 8/2016, the definition of people with disabilities is every person who experiences physical, intellectual, mental, and/or sensory limitations for a long period of time, which can cause them to experience obstacles and difficulties in interacting with the environment to fully participate with other citizens based on equal rights (UU Nomor 8 Tahun 2016, 2016). The WHO also defines disability as a general term used for limitations in activity and participation experienced by a person.

According to data reported by the World Health Organization, around 1.3 billion people have significant disabilities. This figure is 16%, or 1 in 6 of the total population worldwide (World Health Organization, 2023). Indonesia is one of the countries that contributes a large number of people with disabilities. Based on data from the 2020 Central Bureau of Statistics research, the number of people with disabilities in

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Indonesia reached 22.5 million or around 5% of the total population in Indonesia (Biro Hubungan Masyarakat Kementerian Sosial RI, 2020). One of the provinces with the highest number of people with disabilities is West Java, with the number reaching 72,565 people in 2022, which increased from 35,953 in the previous year. Based on data from the West Java Province Central Bureau of Statistics. A total of 4,444 of this number are in Bandung City (Badan Pusat Statistik Provinsi Jawa Barat, 2024).

Despite these significant and large numbers, disability inclusion remains limited, as seen in many challenges faced by people with disabilities, such as unequal access, which impacts the achievement of various sustainable development goals. In assessing the inclusiveness of an area, an index commonly used is the inclusiveness index. The inclusivity index is a benchmark of inclusive development that focuses on disability, ethnic, racial, religious, and gender equality in areas such as politics, income inequality, incarceration rates, gang violence, immigration, and refugee policies. Based on the 2020 global inclusivity index, Indonesia is ranked 125th with a score of 26.50. This score lags behind many other countries, including fellow Southeast Asian countries such as Vietnam and the Philippines (Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional, 2021).

However, the current inclusiveness index is unable to assess inclusivity on an individual basis. This creates a clear research gap in understanding how local parties, such as health cadres responsible for small areas, perceive and implement disability inclusion in their work. According to Meliani, a health cadre is someone selected by the community and trained to deal with individual and community health problems, working in close contact with places where health services are provided (Asiah et al., 2021). Given the large number of people with disabilities, health cadres play a very important role in increasing disability inclusion, especially in Bandung City.

As can be seen from the definition, health cadres are assigned to health services that are close to the community. Therefore, it can be said that cadres are a bridge between health service activities directly from the government and the community. In carrying out their duties optimally, various influencing factors certainly exist. These factors can include cadres' knowledge and behavior regarding their role, such as in disability inclusiveness. Therefore, it is very important to measure the level of knowledge, attitudes, and behavior of cadres on this matter (Kementerian Kesehatan Republik Indonesia, 2018).

One way to conduct the evaluation is by using a questionnaire instrument. The questionnaire used in this study was designed to measure various indicators related to disability inclusion in Bandung City. This instrument will evaluate the viewpoints of health cadres regarding the implementation of disability inclusion. In conducting an evaluation, it is very important to test the quality and suitability of the instrument. A proper instrument is needed to measure indicators accurately and effectively. This study, therefore, aims to develop and evaluate a questionnaire instrument for that purpose. To test the validity and reliability of an instrument, statistical analysis methods can be used. One method that has been used frequently over time is Rasch Model Analysis (Van Zile-Tamsen, 2017).

Rasch Model Analysis is a psychometric technique developed to increase the accuracy of researchers in constructing an instrument, monitoring respondent performance, and evaluating the quality of the instrument itself. According to Suryani, the Rasch Model can be used in determine the reliability index, analyze items at each level, assess respondent reliability and dimensionality, and detect items bias in the instrument. The Rasch Model is not only used to analyze instruments and questions, but also to assess respondents, which is the primary objective of this study. The Rasch model is able to determine the ability of the respondent, in this case, the health cadre, where the probability of answering a question correctly increase monotonically with the cadre’s ability (Tesio et al., 2024). Thus, it can be said that the Rasch Model can be analyze from two perspectives.

In addition, the Rasch Model is relatively easy to apply and produces accurate analytical results. The Rasch Model employs a data measurement method to determine the relationship between respondent ability (person ability) and item difficulty. This can be achieved using a logarithmic function to produce measurements with the same interval value (Ekstrand et al., 2022). Due to the advantages and objectivity of the Rasch Model, this method is often chosen over other methods such as Classical Test Theory (Azizah & Wahyuningsih, 2020). The need to validate an instrument for proper use makes determining the right analysis method crucial. For those reasons, Rasch Model Analysis is an appropriate method to test the validity and reliability of this instrument.

B. Methods

This study uses a quantitative research method with a cross-sectional model to determine the validity and reliability of the disability inclusion measurement instrument. The study was carried out by collecting secondary data, which is part of the study phase of the Research for the Acceleration of Head Lector on behalf of Lukman Hilfi No. 1649/UN6.3.1/PT.00/2024, Period 2023-2024. The data were obtained online through Google Forms and questionnaires as research instruments distributed to health cadres in Bandung City. In determining the reliability and validity of the instrument, the Rasch Model Analysis approach was used. This approach was used to test the validity of the instruments applied in the study. The test was conducted using Win Step software.

The population in this study consisted of all data collected through the disability inclusion questionnaire. The subjects were health cadres who filled out the disability inclusion capacity questionnaire, totaling 709 people. There were 61 participants who were excluded from the dataset because they refused to be respondents in this study. In addition, 22 respondents had incomplete data and were also excluded, resulting in a final sample 626 respondents. The sampling technique used in this study was total population sampling.

While the use of Google Forms allows for efficient data collection, it is important to acknowledge several potential limitations and biases associated with this method. First, the study excluded 22 responses due to incomplete data, which introduces a risk of missing data bias if those respondents gave significantly different responses from the final sample. Second, the administered online format of the questionnaire may introduce selection bias, as it potentially excluded certain demographics, such as older or less digitally literate cadres with no access to technology. Furthermore, non-response bias might also affect the findings if those who chose not to participate differ systematically from those who did. These limitations were considered in interpreting the results and are important to address in future studies.

The study was conducted in all sub-districts of Bandung City over 6 months, from July 2024 to December 2024, using secondary data from the previously conducted Research for the Acceleration of Head Lectors.

We used Rasch Model Analysis to evaluate the validity of the disability inclusion capacity instrument, which assumes that each scale item has different preference levels. Rasch Model Analysis is a mathematical model that assumes that each scale item has a different value or difficulty level (Hilfi et al., 2021). In this method, two interrelated factors are the difficulty of the question (item difficulty) and the ability of the respondent (person ability), both of which are analyzed and distributed using a unit of measurement called logit (log-odds unit) (Bond et al., 2020). The Rasch model also converts raw data from an ordinal scale based on raw score into an interval scale, namely the logit (Riani Siregar et al., 2021).

According to Messick, construct validity is defined as an evaluation of the extent to which a particular concept or construct analyzes the performance of an instrument or test (Ravand & Firoozi, 2016). In this study, we evaluated the construct validity of the instrument based on the following six indicators according to the validity and reliability guidelines (Hilfi et al., 2021).

1. Fit Statistics

   Fit statistics are used to evaluate the fit of the items or questions of the instrument. In analyzing this, the average outfit mean-square (MnSq) and each of the item and person fit statistics are used. Item fit statistics evaluate how the questions on the instrument perform. If there are items that do not fit (misfit), the questions do not measure the same construct or are irrelevant. Meanwhile, person fit shows how respondents' answers match the expectations of the Rasch model (Hilfi et al., 2021). In analyzing fit statistics, misfitting items are found if they have at least two values that do not meet the standard of the following three categories: 0.5 < outfit MnSq < 1.5 logits, -2.0 < outfit ZSTD < 2.0 logits, and 0.4 < Pt Measure Corr < 0.85 (Sumintono & Widhiarso, 2015).

2. Unidimensionality

   Unidimensionality is a fundamental requirement in constructing the validity of an instrument. An instrument can only be classified as unidimensional if the total variance explained by measure value is >50% (Linacre, 2025).

3. Response Category Function

   This indicator assesses how well the response categories (response options) of each item can be distinguished. Evaluation is carried out based on compliance with the Andrich threshold which must

be appropriate, and each category must have the same level of probability. The evaluation criteria for this indicator are as follows: (1) the Andrich threshold difference value must be between 1.4-5 logits; (2) the average measures value as well as the Andrich threshold difference must increase monotonically; (3) the outfit MnSq value for each category is <1.5; and (4) each category must have the same peak curve along the continuum (Hilfi et al., 2021; Linacre, 2025).

4. Reliability and Separation
   a. Reliability

      Reliability will assess how well the instrument used is able to produce stable and consistent results when tested on the same population. The reliability of an instrument can be tested using the reliability test (Cronbach-alpha), person-reliability, and item-reliability. The Cronbach-alpha value is between 0 and 1.0. The closer it is to 1.0, the less likely it is that there is an error from the instrument (Izah et al., 2024; Raof et al., 2021). Meanwhile, the reliability value required to be considered sufficient is 0.80 and a value of 0.90 is considered excellent (Hilfi et al., 2021).

   b. Separation Index

      The separation index assesses how well the instrument categorizes people or items. The greater the separation value, the better the ability and quality of the instrument to identify groups of respondents and items. A separation index value of at least 2 is required (Fitrah et al., 2024).

5. Appropriateness of the item difficulty level for the sample (Targeting)

   The appropriateness of the difficulty level of the questions in the instrument is analyzed through this indicator. It can be seen using targeting and is also shown through Wright map (person-item map). The Rasch model method analyzes targeting by evaluating the person-item mean difference value. If the value reaches zero, it indicates that the instrument has perfect targeting. If the value is below 1, it indicates that the instrument has good targeting. Meanwhile, a value above 1 indicates mistargeting. In addition, targeting is also evaluated by looking at the single target coverage where the larger the targeting area of the instrument, the higher the targeting of it (Hilfi et al., 2021).

6. Cut-off Point

   The Rasch analysis data that has been collected will be divided into 3 categories, namely poor, moderate, and good. Each aspect or domain result of the instrument will be categorized based on the following limits: Low: Value < Mean - Standard Deviation; Medium: Mean - Standard Deviation ≤ Value < Mean + Standard Deviation; and High: Mean + Standard Deviation ≤ Value

C. Results and Discussion

1. Fit Statistics

   Initial analysis was conducted on a 53-item instrument tested on 30 respondents. After revising and refining the items, a 25-item instrument was developed and tested again to 30 respondents. Then, the final version of the instrument was distributed to 626 cadres living in Bandung City, which are the main respondents in this analysis. An evaluation of the final 25-item disability inclusion capacity instrument was conducted. The following are the steps to evaluate fit statistics:

   a. The results of the analysis showed 174 respondents who did not meet the standard for satisfactory value, i.e. outfit value of Mn Sq > 1.4 logits and those who were considered not fit according to WinStep analysis were called misfitting persons.
   b. For the 53-item version, 4 misfitting items were found. The 4 items were J3, J4, J18, and J1.
   c. In the 25-item version tested on 30 respondents, one misfitting item (J3) was found. Meanwhile in the full dataset of 626 respondents, the 25-item version showed 3 misfitting items (J2, J1, and J11), even though the Pt Measure Corr. values remained within acceptable limits.
   d. In addition, the average outfit MnSq of three versions of the instrument has a value of 1.01 and 0.92 logits respectively, thus meeting the requirements of the standard fit principle of the Rasch Model.

   The construct validity evaluation of the instrument using participants is shown in Table 1. The characteristic data of the respondents are shown in Table 2 with an average age of 49.61 ± 9.52 years. Almost all cadres in this study were female (99%). The majority of cadres were in the middle adulthood age group (40-60 years) as much as 74% and most had a last education level of high school / equivalent or above (79.7%). Meanwhile, Table 3 shows the outfit and infit MnSq values of this instrument using 626 respondents. The results obtained are items J1, J2, and J11 as misfitting items.

2. Unidimensionality
   Based on the results of the analysis of the three versions of the instrument, the values of variance explained by measures were 91.9%, 48.6%, and 44.1% as shown in Table 1, all of which showed support for the principle of unidimensionality. This value indicates that the instrument is valid and can explain the variation that already exists in the instrument, because it has a value of ≥ 40% and the value of unexplained variance in first contrast <15%, which is 12.6%, 9.3% and 7.4% respectively. The value of eigenvalue units found in the analysis of 626 respondents is 3.3, so it is interpreted that there are 3 items that do not measure one dimension. The value is slightly larger than expected (ideally <3), yet overall the instrument satisfies the Rasch principle of unidimensionality.

3. Response Category Function
   As shown in Table 4, the evaluation of the response category function values of the instrument on the 25-item version with 626 respondents shows that:
   a. The values of observed average measures (0.97 > 0.20 < 1.45 < 4.92) and Andrich thresholds (τ1 -2.09 > τ2 -2.21 < τ3 4.30) consisting of 4 item choice categories (strongly disagree, disagree, agree, and strongly agree) show inconsistent improvement. The results of the analysis show that there is a category of choice interfering with the calculation, specifically, the 'disagree' choice.
   b. The difference of Andrich thresholds (τ1 -0.12 < τ2 6.51) where the difference between category 2 'disagree' and category 3 'agree', as well as between category 3 'agree' and category 4 'strongly agree' shows a number less than 1.4 logits so that the category has a tendency to misfit with the model.
   c. The MnSq fit of almost all categories shows a value of < 2 logit so that it can be categorized as fit with the model.
   d. The peaks of the probability curves of the 4 categories show results that do not meet the expectations of the Rasch model. The peak probability of the 'disagree' category is much lower than the other 3 categories.

   Although these issues persisted across versions, the final version still met other critical validity criteria. Thus, the 4 categories were retained during this phase, but future simplification to 3 categories may improve clarity and response consistency.

   The 4-category probability curve is shown in Figure 1. These probability curves illustrate how likely a respondent is to select each response category based on their capacity. The X-axis interprets what is being measured (disability inclusion capacity). Meanwhile, the Y-axis interprets the probability of answering each category with a range of 0 to 1. The peaks of the curves indicate the capacity at which each category is most likely to be chosen. For example, looking at the red curve (Category 1=Strongly Disagree), the likelihood of a person responding strongly disagree decreases as their disability inclusion capacity increases. A well-functioning instrument should have distinct peaks for all the categories, indicating that the probability of choosing each category is appropriately distributed and that respondents are able to differentiate between them.

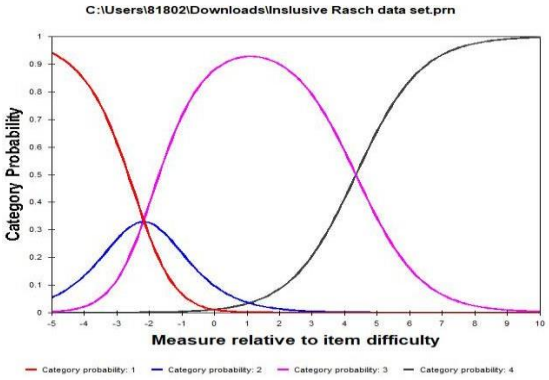

Figure 1. Category Probability Curve of the Instrument

4. Reliability and Separation
   a. Reliability
      The person reliability values generated from the analysis of three versions of the instrument (0.95, 0.92, and 0.89) showed consistent results. Not only that, the Cr-α values of all three (0.97, 0.96, and 0.96) were also very good and met the expectations of the Rasch Model. Unfortunately, the item reliability values on the 53-item version (0.72 = fair) and the 25-item version with 30 respondents (0.67 = fair) of the instrument gave unsatisfactory results. However, this value was improved through the results from the analysis of the 25-item version with 626 respondents (0.96 = excellent), demonstrating the refined instrument's improved performance. Therefore, it can be interpreted that the instrument has excellent internal consistency, stability, and the items are able to measure disability inclusion according to the cadres as participants.
   b. Separation Index
      The separation index value found in the instrument analysis provides satisfactory results. The person separation index values (4.33, 3.38, and 2.88) obtained from the three versions of the instrument have met the requirement of ≥ 2. Although the first two versions did not provide satisfactory results for the item separation index category, the 25-item version of the instrument with 626 respondents managed to provide excellent results (5.23). Hence, it can be concluded that the instrument is very good for measuring people and items based on disability inclusion capacity.

5. Appropriateness of the item difficulty level for the sample (Targeting)
   Table 5 shows the results of the analysis of the three versions of the instrument with average logit values for person and item that are greater than 1. In the final 25-item version of the instrument with 626 respondents, the average logit value for person (M = 2.51, SD = 2.50) is also higher than the average logit for item (M = 0.00, SD = 0.62) with a difference of 2.51 logits. It can be seen that the difference produced by the three versions of the instrument indicates mistargeting between the items and respondents.

   The targeting area between item difficulty and respondents' disability inclusion capacity in the first two versions was also not very satisfactory (40% and 26.67%). Neither of the two versions found any participants who scored below the item difficulty area. Nonetheless, the targeting area generated by the 25-item version with 626 respondents was the best among the three, which was 48.08%, though only 0.32% of respondents were below item difficulty and 51.6% were above. Figure 2 shows Wright's map to illustrate the targeting of the 25-item version of the instrument (626 respondents) and Table 5 shows the targeting statistics of all three versions.

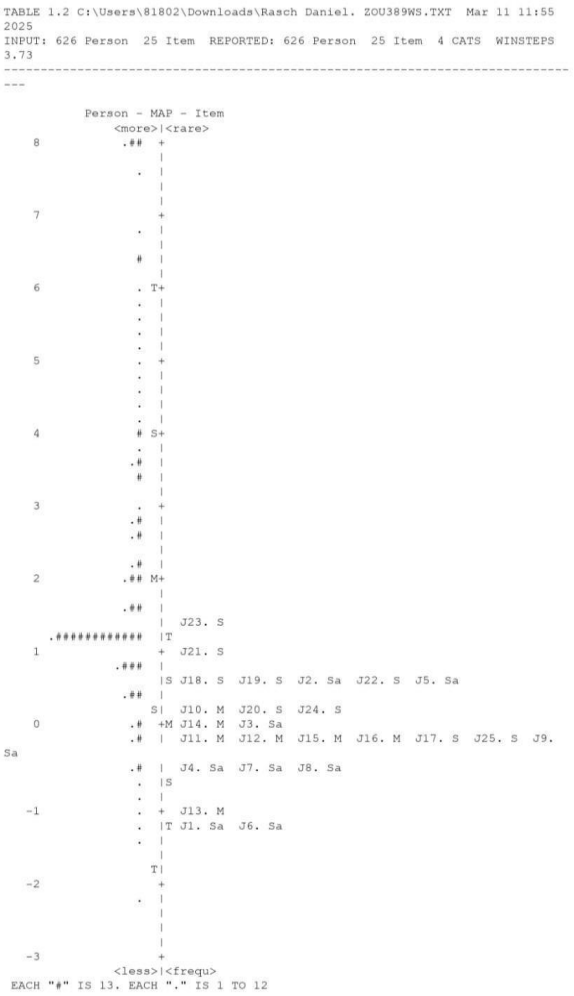

Figure 2 Wright Map of Person-Item Distribution from the 25-item version of the instrument. Each "#" represents 3 subjects, each "." represents 1 subject (M = mean; S = 1 standard deviation from the mean; T = 2 standard deviations from the mean)

6. Cut-off Point
   In categorizing the measurement results into three categories (low, medium, and high), the guidelines for cut-off points from the previously determined analysis results are used. Based on these guidelines, the cut-off points for each domain or aspect are set out in Tables 6 and 7.

Table 1. Rasch Model Analysis of the Instrument

No.	Instrument	Average Outfit MnSq	Variance explained by measure	Measurement reliability (Cr- α)	Person-reliability	Item-reliability	Person-separation	Item-separation
1.	53-item version	1.01	91.9%	0.97	0.95	0.72	4.33	1.62
2.	25-item version (30 respondents)	1.01	48.6%	0.96	0.92	0.67	3.38	1.43
3.	25-item version (626 respondents)	0.92	44.1%	0.96	0.89	0.96	2.88	5.23

Table 2. Characteristics of the Respondents

Variables	Frequency (%)
Age (mean ± SD)	49.61 ± 9.52
Sex	
Male	1.0
Female	99.0
Marital status	
Single (not married)	2.6
Widow or widower	85.1
Married	12.3
Education status	
Uneducated	0.2
Graduated from elementary school	20.1
Graduated from high school or above	79.7
Occupation status	
Non-worker	11.2
Worker	88.8

Table 3. Mean Square (MnSq) of the Instrument

		Sample (N)	
Code	**Questions**		
		Infit MnSq	**Outfit MnSq**
Awareness			
J1	I know that people with disabilities have diverse identities, desires and hopes for a good life, just like people without disabilities.	**1.68**	**2.07**
J2	I know that we should not treat people with disabilities out of compassion.	**2.06**	**2.08**

Code	Questions	Sample (N)	
		Infit MnSq	Outfit MnSq
J10	In my opinion: it is important to know that we should not treat people with disabilities out of compassion.	**1.39**	**1.32**
J17	I interact with people with disabilities without discrimination/stigma.	**0.80**	**0.59**
Participation			
J3	I know the rights of people with disabilities to participate in the community.	**1.14**	**0.96**
J4	I know that people with disabilities can participate in the community regardless of impairment, gender, age, ethnicity and other characteristics.	**1.21**	**1.11**
J11	In my opinion: it is important to know the rights of people with disabilities to participate in the community.	**0.58**	**0.46**
J12	In my opinion: it is important to know that participating in socio-political decisions is a right that people with disabilities have (e.g. general elections, neighbourhood elections, family welfare meetings, etc.).	**1.03**	**0.92**
J18	I am able to involve people with disabilities in community participation regardless of impairment, gender, age, ethnicity and other characteristics.	**0.79**	**0.69**
Accessibility and Universal Design			
J5	I know the definition of accessibility for people with disabilities.	**0.78**	**0.67**
J6	I know that people with disabilities need the same legal protection as people without disabilities.	**0.91**	**1.03**
J13	In my opinion: it is important to know that transportation and public facilities should be disability-friendly.	**0.80**	**0.63**
J19	I have helped people with disabilities access disability-friendly transportation and public facilities.	**0.92**	**0.91**
J20	I have assisted people with disabilities in obtaining legal protection.	**1.01**	**0.77**
Twin-Track Approach			
J7	I know that collecting and recording data on people with disabilities is necessary for policy decision-making.	**0.91**	**0.71**

Code	Questions	Sample (N)	
		Infit MnSq	Outfit MnSq
J14	In my opinion: it is important to know that every program and policy making process must involve and consider people with disabilities.	**0.85**	**0.68**
J21	I assist people with disabilities in participating in local and national institutions, such as legislative bodies, public services, and the judiciary.	**1.07**	**1.10**
J22	I regularly collect and record data on people with disabilities in my community.	**0.89**	**0.87**
Empowerment			
J8	I know that people with disabilities have the right to manage their own personal lives.	**0.70**	**0.54**
J15	In my opinion: it is important to recognize that people with disabilities have the right to make decisions for themselves.	**0.68**	**0.55**
J23	I involve people with disabilities in daily activities and community events.	**0.95**	**1.16**
J24	I give people with disabilities the freedom to make decisions for themselves.	**0.85**	**0.79**
Gender Equality			
J9	I know that gender equality for disabilities is needed to create a disability-friendly environment.	**0.96**	**0.83**
J16	In my opinion: it is important to know that gender equality for people with disabilities is needed to create a disability-friendly environment.	**0.70**	**0.58**
J25	I treat men and women with disabilities without discrimination.	**1.09**	**0.98**

Table 4. Response Category Function Statistics

Category		53-*item version*				25-*item version* (30)				25-*item version* (626)			
		OA	**AT**	**ATD**	**OM**	**OA**	**AT**	**ATD**	**OM**	**OA**	**AT**	**ATD**	**OM**
0	Strongly disagree	1.25	NA	NA	2.54	0.74	NA	NA	1.50	0.97	NA	NA	2.04
1	Don't	0.58	-1.34	**-0.24**	1.12	1.64	-	**1.10**	1.19	0.20	-2.09	**-0.12**	0.83

	category	53-*item version*				25-*item version* (30)				25-*item version* (626)			
		OA	**AT**	**ATD**	**OM**	**OA**	**AT**	**ATD**	**OM**	**OA**	**AT**	**ATD**	**OM**
	agree						2.55						
2	Strongly agree	1.59	-1.58	4.50	0.83	2.21	-1.45	5.45	1.08	1.45	-2.21	6.51	0.85
3	Totally disagree	4.27	2.92	A	0.86	5.33	4.00	NA	0.84	4.92	4.30	NA	0.76

Table 5. Targeting Statistics of the Instrument

No.	Instrument	Sample (freq)	Person logit mean (SD)	Person-Item mean difference	Targeting area (%)	Score above the range (%)	Score below the range (%)
1.	53-item version	30	3.15 (2.25)	3.15	40	60	0
2.	25-item version (30 respondents)	30	4.21 (2.58)	4.21	26.67	73.33	0
3.	25-item version (626 respondents)	626	2.51 (2.50)	2,51	48.08	51.6	0.32

Table 6. Aspect Cut-off Point

Aspect	Total	Percentage (%)
Knowledge		
Low Medium	33	5.3
High	460	73.5
	133	21.2
Attitude		
Low	30	4.8
Medium	463	74.0
High	133	21.2
Behavior		
Low	49	7.8
Medium	470	75.1

Aspect	Total	Percentage (%)
High	107	17.1

Table 7. Domain Cut-off Point

Domain	Total	Percentage (%)
Awareness		
Low	69	11.0
Medium	422	67.4
High	135	21.6
Participation		
Low	21	3.4
Medium	467	74.6
High	138	22.0
Accessibility and Universal Design		
Low	48	7.7
Medium	472	75.4
High	106	16.9
Twin-Track Approach		
Low	30	4.8
Medium	498	79.6
High	98	15.7
Empowerment		
Low	19	3.0
Medium	502	80.2
High	105	16.8
Gender Equality		
Low	32	5.1
Medium	439	70.1
High	155	24.8

This is the first study conducted to evaluate the validity of an instrument to measure disability inclusion capacity in cadres using Rasch Model Analysis. Given the high number of people with disabilities in Indonesia, especially in Bandung City, as well as the challenges and barriers they face, it is important to measure the level of knowledge, attitudes, and behaviors of health cadres towards disability inclusion. Health cadres play a huge role in connecting health workers with people with disabilities. This study provides a strong psychometric foundation for future research and policy planning.

In this study, we used 709 respondents to evaluate the instrument. Of the 709 respondents, 83 participants in total were excluded from the dataset. In addition, 38 respondents had extreme category values that needed to be excluded so as not to interfere with the average value of the summary statistic calculation. The extreme values found can result from various conditions or scenarios, such as lucky guesses,

carelessness, errors in choosing answers, misunderstanding respondents' ignorance of the questions (Van Zile-Tamsen, 2017). From the results of the analysis conducted, it was identified that the instrument was unidimensional and had good reliability or validity. There were various misfitting items found in all three versions that could affect the performance of the analyzed instrument.

Based on the guidelines used (Hilfi et al., 2021), the respondents who had outfit MnSq values > 1.4 logits and who were considered not fit according to WinStep analysis were called misfitting persons. The analysis results prove various aspects that support the validity of the instrument. Based on the 626 respondents data used, the variance explained by measure value is 44.1%, which indicates that the instrument is valid because it has a value ≥ 40%. This value supports the principle of unidimensionality of the Rasch Model.

The average of the three versions of the instrument's MnSq outfit of 1.01 and 0.92 logits met the fit requirements of the Rasch Model. However, the same misfitting item was found in all three versions of the instrument, J1 'I recognize that people with disabilities have multiple identities, desires, and hopes for a good life, just like people without disabilities'. This indicates that the item does not predict or indicate the ability of the respondent well (Hilfi et al., 2021). The possibility is that respondents experience confusion when answering these questions because they do not fit the constructs presented by the instrument. Therefore, deletion of item J1 'I know that people with disabilities have diverse identities, desires, and hopes for a good life, just like people without disabilities' should be done so as not to confuse respondents.

The analysis also showed that the 53-item version of the instrument has a Cr-α value of 0.97, which means it is very good and is supported by the other two versions with a value of 0.96. This value means that the instrument can provide measurement results with excellent internal consistency and stability so that the items are able to measure disability inclusion according to the cadres as participants. In addition, the separation index values found in the instrument analysis provided satisfactory results. Therefore, the instrument is solid to use in measuring the inclusion capacity of a person with a disability, especially cadres.

In addition, the response category scale of the instrument still shows deficiencies and results that have not met the expectations of the Rasch Model. This can be seen from the observed average value and Andrich thresholds that do not show consistent improvement. Differences in the peak points of the probability curves of the 4 categories of choices were also found in the three versions of the instrument, precisely in option 2 (disagree). Nevertheless, we did not downgrade the categories because the instrument still gave good results in other aspects, such as unidimensionality. The instrument was still able to differentiate between respondents' capacity for disability inclusion as well as rank the difficulty of the items in the sample. Though combining multiple response categories may be necessary in order to improve the effectiveness of the instrument in the future. It is recommended to use 3 response options rather than 4 so that respondents are not biased in filling out the instrument.

Although the targeting area between item difficulty and respondents' disability inclusion capacity level in the 53-item version and 25-item version of the instrument reached 40% and 48.08% (626 respondents) respectively, most of the analyzed items were rated as too easy for respondents. This is indicated by a total of only 2 participants from all three versions of the instrument who scored below the average item difficulty level. Meanwhile, most of the respondents scored above the average item difficulty. The data shows that some items are not very good at targeting respondents. Further research is needed on respondents with a more even and unequal level of abilities. Based on the results of the analysis of the ability level of respondents through the cut-off point category, the majority of respondents have a moderate level of ability in each aspect/domain of the instrument.

We recognize that this study has the following limitations. The disability inclusion capacity of the respondents was not evenly distributed among the participants. The respondents generally had a disability inclusion capacity that was too high, thus falling outside the target area. We recruited health cadres from one region of Indonesia (Bandung), which may limit the generalizability of the findings to other regions in Indonesia. The use of online surveys via Google Forms may also introduce response bias, digital access limitations, and missing data issues. Despite these challenges, this validated instrument represents a critical step toward quantitatively assessing disability inclusion at the grassroots level. We believe and

trust that these findings will contribute to expanding the discussion and evidence related to disability inclusion capacity in Indonesia.

D. Conclusion

Based on the study results discussed in the previous chapter, in accordance with the problem formulation in this study, the following conclusions can be drawn:

1. Although the instrument had inappropriate items, unsatisfactory response category functioning, and poor targeting of the sample, Rasch Model Analysis revealed that the instrument was unidimensional and had satisfactory internal consistency. These results indicate that the instrument has acceptable construct validity for assessing disability inclusion capacity in health cadres in Bandung, Indonesia.
2. Analysis of the reliability of the instrument yielded excellent Cr-α, person reliability, and item reliability values. Therefore, it can be interpreted that the instrument has excellent internal consistency and stability in making measurements.

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