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Research Article

Developing of health literacy instrument on human kidney for senior high school student

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Abstract: Health literacy plays a pivotal role in shaping an individual's adoption of a healthy lifestyle, particularly among students transitioning into adolescence and adulthood. Hence, integrating health literacy into educational curricula is imperative. For instance, the study of the human kidney excretory system, which necessitates the use of measuring instruments, can serve as a platform to enhance students' health literacy skills within the realm of biology education. This study was conducted to develop and determine the feasibility of human kidney health literacy instruments. The research method used in this study is ADDIE development research which consists of 5 stages, including (1) preliminary needs analysis (2) product design (3) Development (4) Implementation, and (5) evaluation. The trial results stated that the instrument was feasible to use with a linguist assessment of 9.8% very feasible category, and a material expert of 91% very feasible category. The empirical validity test was conducted with a limited trial to 47 students of Al-Azhar 9 Yogyakarta High School and the results showed that 92% of the items were declared valid with a high reliability value of 0.7. This study produced 16 statement items on the attitude aspect, 6 items on the knowledge aspect, and items on the skill aspect. The total question items produced in this study were 24 question items that were valid and feasible to use as a tool to improve the quality of education.

Keywords: health literacy; high school student; human kidney; instrument

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1. Introduction

Health literacy is defined as an individual's ability to obtain, process, and understand basic health information needed to make appropriate health-related decisions (R. Parker & Ratzan, 2010). The level of health literacy of a person is a determinant of health outcomes or the results obtained from healthy efforts in turn determine the quality of life of individuals (Amin et al., 2022). By understanding good health literacy, a person can form healthy living behaviors because learners will have a positive attitude from the learning experience that has been obtained (Kovesdy, 2022). Health literacy is not only related to the ability to read and write health information but also influenced by understanding and perception of printed media messages, digital media and verbally about health (Kühn et al., 2022).

The importance of understanding health literacy needs to be owned by high school students as part of adolescence, this is important to train and strive for healthy living behavior, both with themselves, families and communities (Shahid et al., 2022). Basically, people are required to have health literacy skills (Coughlin et al., 2020) to be able to understand the dosage of drugs before use, food and beverage labels, and be able to calculate blood glucose to the body (Liu et al., 2020). Therefore, measuring the level of health literacy is important to be carried out in high school students.

Some previously published survey research states that health literacy in high school students is still relatively low, some of which are research conducted by Wood et al. (2023). The study revealed a concerning deficiency in health literacy among participating students across various health and social care disciplines in Australia. Another study found that among health vocational high school students reported adequate overall health

literacy, but highlighted limitations in specific sub-dimensions (Zopcuk et al., 2022). Another study inform that 18.7% of the sampled Italian students exhibited low levels of health literacy (Velasco et al., 2021). Several studies in Indonesia also report similar information regarding low health literacy among students (Candrakusuma & Nurhayati, 2020; Sayekti & Nurhayati, 2020).

A limitation in prion Indonesian studies is the absence of health literacy instrument to specific topics, notably within the field of biology, such as human excretion. Therefore, this study addresses this gap by innovatively developing health literacy instruments that integrate seamlessly with student subject matter. In this phenomenon, biology is one of the subjects that is very potential to be associated with health literacy is a biology subject that discusses a lot of body system material. One of them is the material on the excretory system of the human kidney which has experienced many disorders or decreased function due to low public health literacy.

There are at least 276 instruments used to measure health literacy in various health contexts, languages, and also age groups that can be accessed in a database called Health Literacy Tool Sheed. The European Health Literacy Survey Questionnaire (HLS-EU-Q) inaugurated in 2009-2012, and the Newest Vital Sign (NVS) developed by Weiss (2005). These are the 2 most commonly used instruments in measuring health literacy in adolescents and adults. In adolescents, health literacy measurement will be more efficient if inserted into teaching and learning activities (Urstad et al., 2022). However, the HLS-EU-Q and NVS instruments still cannot be used to measure students' health literacy skills because the questions in them are still too general to be implemented in learning activities.

Previous search results identified several studies on the development of health literacy instruments including the Brief Health Literacy Screen (BHLS) (Sand-Jecklin & Coyle, 2014), and The Test of Functional Health Literacy in Adults (TOFHLA) (R. M. Parker et al., 1995), and the Rapid Estimate of Adolescent Literacy in Medicine (REALM-Teen) (Manganello et al., 2017). However, these instruments have not been specifically oriented to kidney health literacy. In fact, several studies have shown that kidney disorders are one of the diseases at risk of causing death. Chronic kidney disease is one of the most common public health problems. Kidney disease is ranked the 12th most common cause of death, accounting for 1.1 million deaths worldwide. Deaths caused by chronic kidney disease as a whole have increased by 31.7% over the past 10 years, making it one of the leading causes of death (Damayantie et al., 2022).

In a study by Jankowski et al., (2021) stated that chronic kidney disease was ranked 17th and became the leading cause of loss of life over the years in the world, an increase of 40.4% since 2005, and the third largest increase of all major causes of death. This is because chronic kidney disease can also trigger other non-communicable diseases. This statement is corroborated by Kiuchi & Mion, (2016) study that patients with kidney disease have a high risk of cardiovascular disorders. This phenomenon is the reason why the knowledge, attitudes and skills of kidney health literacy are important to be applied as early as possible.

The first thing that must be done to determine the level of health literacy is to find out how students' attitudes, knowledge, and skills are. The measurement certainly uses an instrument that is feasible or valid in terms of logical and empirical. Therefore, the purpose of this study is to develop and produce an instrument of kidney organ health literacy in high school students. The development of instruments that can contain the dimensions of health literacy with a combination of material content of the human kidney excretory system. Previous research conducted by Rojas et al., (2022) has provided an overview of the instruments used to measure health literacy in specific diseases, namely cardiovascular, but these studies have not provided an overview of the implications in the world of education. Therefore, the aim of this study was to develop and assess the feasibility of instruments for measuring human kidney health literacy. Research and development efforts greatly contribute to creating a product. The sequence of steps in research and development makes the instrument product being developed more accurate because it includes an assessment of logical validity and practicality as an empirical test of an

instrument that focuses on biology lessons, material on the human kidney excretory system for high school level health literacy.

2. Materials and Methods

2.1 Research design

This type of research is research and development. The principle of this research development refers to the ADDIE development research model developed by Branch (2009) and consists of 5 stages, namely (1) initial needs analysis (2) product design (3) Development (4) Implementation, and (5) evaluation.

2.2 Population and Samples

The population in this study were all students of Al-Azhar Yogyakarta High School with a total of 339 students. The selection of grade XI students is based on the demands of the curriculum which studies about body systems, one of which is the excretory system of the human kidney. Thus, it can be assumed that students who are in grade XI already have prior knowledge about the structure and function of the kidney organ. The sampling technique was carried cluster random sampling).

2.3 Instrument

The research instrument is an instrument to validate the kidney health literacy instrument developed. The instruments used are material expert and linguist validation instruments. The instrument construct developed consists of 3 aspects, namely attitude, knowledge and skills. This refers to PISA which establishes 3 major dimensions of literacy in its measurement, namely (1) science process competencies (skills) (2) science content / knowledge, and (3) student attitudes to science (OECD, 2019). Therefore, making an instrument that aims to measure literacy at least covers these 3 dimensions. The health literacy instrument was assessed from several aspects. Aspects of linguist assessment consist of (1) using straightforward language (2) communicative (3) suitability of Indonesian language rules. While the material expert assessment aspects consist of (1) feasibility of material content (2) suitability of evaluation/assessment with students' cognitive (3) clarity of material and supporting images (4) alignment with health literacy indicators. In addition, a note column is provided so that validators can provide input on the test instruments developed.

2.4 Procedure

The research steps used refer to the ADDIE model developed by Branch (2009) (Figure 1). Which consists of 5 steps, namely (1) initial needs analysis, at this stage a literature review is carried out through scientific articles and several social media about human kidney health literacy; (2) Design, instrument design is carried out by identifying 4 health literacy indicators (searching, understanding, assessing, and applying). These indicators were then used as the basis for developing an appropriate instrument to measure health literacy with a focus on the topic of the renal excretory system. The instrument developed consisted of 3 aspects, namely attitude, knowledge, and skills. The attitude aspect was adopted from the HLS-EU-Q47 by analyzing potential statements associated with daily lifestyles related to kidney health. The knowledge aspect contains essay questions about excretory system material in the human kidney based on material indicators and learning objectives. Meanwhile, the skill aspect is adopted from the modified NVS (Newest Vital Sign). In NVS, the skill questions presented are in the form of reading nutritional value information tables on ice cream, while in this study the skill questions presented are in the form of nutritional value information tables listed on bottled tea drinks. (3) Development, at the development stage, the preparation of statement items and questions is carried out by drafting a grid. In Table 1, it has been written that the aspects of attitudes and skills are the result of adaptation from HLS-EU and NVS while the knowledge aspects were developed by the researcher. The development of questions is done by referring to

the demands of the learning curriculum that has been determined and formulating it into a learning objective which is then breakdown again into question indicators. So, the position of the question indicator in the knowledge aspect here is a representation of the orientation of the renal excretory system material with health literacy. This is the innovation point of the research conducted, namely combining instruments with essential biology material studied by students. In general, there are two types of validation carried out, namely expert validation and empirical validation. (4) Implement, at this stage the instrument that has been revised based on suggestions from validators will be tested on 47 students of class XI SMA Al-Azhar 9 Yogyakarta. (5) Evaluate, the evaluate stage is to revise the parts of the instrument that are still missing.

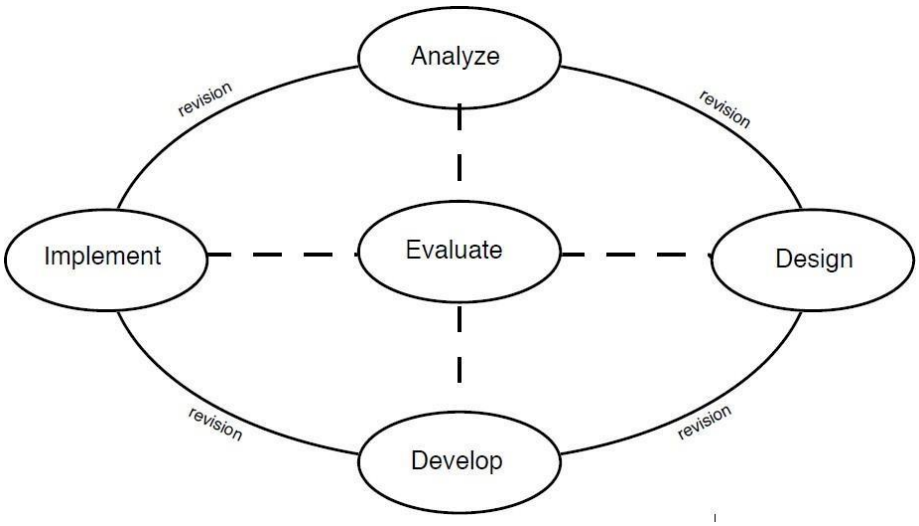

Figure 1. ADDIE development model procedure (Branch, 2009)

2.5 Data analysis techniques

Data analysis was carried out by describing the data from the expert validation results which covered two components of lubrication, namely material and language. Then a descriptive analysis was carried out on the validator's input in the note's column. After descriptive analysis, improvements were made and submitted back to the validator. After that, the validity, reliability, differential power, and level of success were tested on the questions in the health literacy instrument. The validity test was conducted to determine the accuracy of an instrument. The reliability test is used to determine the consistency of the measuring instrument, whether the measuring instrument /instrument developed can be consistent if used repeatedly (Kasmawati et al., 2023). The power difference test is used to determine the ability of the questions in the measuring instrument whether it can be used to distinguish students with low or high abilities. While the difficulty test is used to find out how difficult the questions are to do.

2.5.1 Expert validation analysis

The validator will provide an assessment with a Likert scale of 1-5. The results of the assessment are then calculated using the Formula 1. After the product assessment is complete and the percentage of feasibility is obtained, it is then interpreted into the feasibility category based on the Table 1.

$$\text{Percentage} = \frac{Total\ score\ received}{ideal\ highest\ score} \times 100\% \quad (1)$$

Table 1. Product assessment criteria

Percentage	Criteria
81% - 100%	Veru feasible
61% - 80%	Feasible
41% - 60%	Feasible enough
21% - 40%	Unfeasible
0% - 20%	Very Unfeasible

2.5.2 Empirical validation analysis

2.5.2.1 Question item validation

The validity calculation is carried out using the SPSS application. The decision whether a question item is valid or not is determined from the rcount value, where the statement is said to be valid if the r value> r table. The validity category is suggested by Sugiyono (2017) and is presented in Table 2.

Table 2. Validity level criteria

Value	Category
0.80 < rxy ≤ 1.00	Very high validity (very good)
0.60 < rxy ≤ 0.80	High validity (good)
0.40 < rxy≤ 0.60	Medium validity (fair)
0.20 < rxy ≤ 0.40	Low validity (less)
0.00 < rxy ≤ 0.20	Very low validity (bad)
Rxy ≤ 0.00	Invalid

2.5.2.2 Instrument reliability

Reliability calculations were carried out using the SPSS application. The decision on the level of instrument reliability is determined from the Cronbach's Alpha value. The reliability category values are based on Geldhof et al. (2014) and is presented in Table 3.

Table 3. Criteria for reliability level

Cronbach's Alpha value	Reliability category
0.800 – 1.000	Very high
0.600 – 0.799	High
0.400 – 0.599	Enough
0.200 – 0.399	Low
0.000 – 0.199	Very low

2.5.2.3 Level of difficulty

For knowledge and skill aspects, it needs to be tested further, namely the test of differentiation and level of difficulty. This is done because the type of question presented is in the form of an essay. Making essay questions does not only consider the requirements for validity and reliability. There are further tests used to ensure the feasibility of a question including the test of power difference and difficulty level. The difficulty test is used to determine the balance of questions with easy, medium, and difficult categories proportionally. The formula for determining the level of difficulty in the description question (essay) is in Formula 2 (TK = level of difficulty of the question; x = average score of students for one question item; $Xmaks$ = the maximum score that has been determined

according to the level of difficulty). As for the criteria for the level of difficulty of the test questions, give the following classification in Table 4.

$$TK = x / xmax \quad (2)$$

Table 4. Criteria for level of difficulty

Value	Category
0.00 – 0.30	Difficulty
0.31 – 0.70	Medium
0.71 – 1.00	Easy

Differentiating power is the ability of a question to distinguish between students who are able to work on questions or have high abilities and students who are unable to work on questions or have low abilities. The criteria for the differentiating power index of the test question are presented in Table 5.

Table 5. Differentiating power level criteria

Value	Category
0.71 – 1.00	Very good
0.41-0.70	Good
0.21 – 0.40	Enough
>0.20	Bad

3. Results

3.1 Analyze

At this stage, a literature review was carried out regarding several studies aimed at measuring health literacy in high school students. From the results of the literature review that has been carried out, no research has been found that measures health literacy using appropriate instruments. The instruments used are still too general and have not been linked to the subjects at school. Based on the results of the literature review, it is important to develop a health literacy instrument by linking it to school lessons, namely biology, which is one of the subjects that is very relevant when linked to health literacy because the material in class 11 discusses the structure and function of human organs.

3.2 Design

Design in this instrument prioritize 3 aspects of literacy, which are attitude, skills, and knowledge. The attitude aspect is in the form of a survey adopted from HLS-EU, the knowledge aspect was developed by the researcher by analyzing the learning curriculum at school. Meanwhile, the skill aspect was adopted from the NVS. The detailed framework of the developed health literacy instrument can be seen in Table 6. Each of these aspects contains 4 indicators of health literacy, including (1) seeking health information (2) understanding health information (3) assessing health information, and (4) applying health literacy. The instrument developed specifically refers to the material of the excretory system in the human kidney, therefore it is necessary to analyze the curriculum to be used as indicators that represent health literacy. The detailed health literacy instrument grids can be seen in Table 7.

Table 6. Health literacy instrument framework

Literacy Aspect	Type	Total of items	Source
Attitude	Questionnaire	18	HLS-EU-Q47
Knowledge	Essay question	6	Developed by researcher
Skills	Essay question	5	NVS

Table 7. Health literacy instrument grid

Aspect	Aspect Health Literacy	Item
Attitude	Seeking health information	1,2,11,15
	Understanding health information	3,4,12,13,16
	Assessing health information	5,14,17
	Applying health information	6,7,8,9,10,18
Skills	Seeking health information	1
	Understanding health information	2
	Assessing health information	5
	Applying health information	3,4
Knowledge	Knowledge Analyze the structure of the tissues that make up the kidney organ in the human excretory system.	1,2
	Relating the tissue structure of the kidney organ in the human excretory system to bioprocesses.	3,4
	Analyze the functional disorders that occur in the kidney organ.	5,6

3.3 Development

The kidney health literacy instrument was validated by material and language expert validators. Material expert validators were conducted by animal physiology and anatomy experts from Yogyakarta State University, Indonesia. The results of expert validation are translated into 5 categories, namely very feasible, feasible, less feasible, unfeasible, and very unfeasible. Table 8 present the results of the material expert validation.

Table 8. Material expert validation results

No	Aspects	Percentage	Feasibility
1.	Content	93%	Very Feasible
2.	Evaluation	93%	Very Feasible
3.	Supporting Presentation (Picture)	80%	Very Feasible
4.	Health literacy	100%	Very Feasible
	Total	**91%**	**Very Feasible**

The linguist validation was conducted by lecturer construction of biology education research instruments in Yogyakarta State University. The assessment was carried out by filling out a questionnaire containing 10 statements with 3 aspects. Table 9 present the validation results obtained from material expert validators and linguists.

Table 9. Results of language expert validation

No	Aspect	Percentage	Feasibility
1.	Straightforward	96%	Very Feasible
2.	Communicative	100%	Very Feasible
3.	According to language rules	100%	Very Feasible
	Totality	**98%**	**Very Feasible**

3.4 Implementation

3.4.1 Validity test

After the instrument is declared logically feasible to use, then an empirical test is carried out, namely a limited trial to 49 students in class XI SMA. The purpose in this test to calculate the level of validity and reliability of each question item. The summary of the results of the data analysis of the validity can be seen in Table 10.

Table 10. Results of the question item validity test

Aspect	No. Items	r value	r table	Category
Attitude	1	0.625	0.281	Valid
	2	0.372	0.281	Valid
	3	0.459	0.281	Valid
	4	0.487	0.281	Valid
	5	0.057	0.281	Invalid
	6	0.441	0.281	Valid
	7	0.185	0.281	Imvalid
	8	0.450	0.281	Valid
	9	0.440	0.281	Valid
	10	0.651	0.281	Valid
	11	0.610	0.281	Valid
	12	0.347	0.281	Valid
	13	0.453	0.281	Valid
	14	0.375	0.281	Valid
	15	0.481	0.281	Valid
	16	0.664	0.281	Valid
	17	0.472	0.281	Valid
	18	0.551	0.281	Valid
Knowladge	1	0.812	0.281	Valid
	2	0.867	0.281	Valid
	3	0.779	0.281	Valid
	4	0.700	0.281	Valid
	5	0.612	0.281	Valid
Skill	1	0.671	0.281	Valid
	2	0.700	0.281	Valid
	3	0.654	0.281	Valid
	4	0.437	0.281	Valid

3.4.2 Reliability test

After the question items are declared valid, a reliability test is carried out which serves to show the extent to which the measurement results with the instrument developed can be trusted. This is indicated by the consistency of the scores obtained by subjects measured using the same instrument under different conditions. In a learning test, the score obtained is expected to be able to measure the actual ability (Budiastuti & Bandur, 2014). Measurement is the process of obtaining a score so that a person's measured ability truly describes the characteristics of that person (Suhartini et al., 2022). Test reliability is very important to determine the quality of the test. If students get inconsistent scores on

several tests, even though they use the same test instrument, the final decision regarding whether or not to pass will indirectly also be different (Boumans, 2020). Therefore, in compiling an instrument based on a test of learning outcomes, it is necessary to see the magnitude of the reliability coefficient of the test to be used. This aims to avoid variable measurement failure in research. Table 11 present the results of the instrument reliability test developed.

Table 11. Results of the problem item reliability test

Aspect	Reliability	Total items	Category
Attitude	0.786	16	High reliability
Knowladge	0.786	6	High reliability
Skill	0.501	4	High enough reliability

3.4.3 Difficulty test and differentiated test

Table 12 present the results of the test of the level of difficulty of the developed instrument questions. Based on Table 12, it can be seen that item questions 1 and 4 have a difficult category. It shows that many students have difficulty in answering these items so that they get a lower difficulty index. this is in line with what has been stated (Hanifah et al., 2014) that the more students who answer correctly on the item, the higher the level of difficulty. Conversely, the more students who answer correctly, the lower the level of difficulty. The high difficulty of a question item can be caused by the complexity (complexity) of the subject matter (Pelikan et al., 2023).

Table 12. Results of the level of difficulty test

Aspect	No. item	Mean	Maximum score	Value (Mean/Max)	Category
Knowlagde	1	1.44	5	0,288	Difficult
	2	2.86	7	0,41	Medium
	3	2.49	7	0,36	Medium
	4	1.45	5	0,29	Difficult
	5	2.39	3	0,80	Easy
Skill	7	0.45	1	0,45	Medium
	8	0.30	1	0,30	Medium
	9	0.33	1	0,33	Medium
	10	0.84	1	0,84	Easy

Table 13. Differentiated test results

Aspect	No. item	Differentiating Power	Category
Knowledge	1	0.712	Very Good
	2	0.689	Good
	3	0.596	Good
	4	0.547	Good
	5	0.523	Good
Skill	7	0.224	Medium
	8	0.332	Medium
	9	0.129	Medium
	10	0.075	Bad

In this research show that 50% of the questions were easy, 20% were easy, 20% were difficult, and 10% were bad (elimination). This shows that the items produced are not too easy or too difficult so that they can be used as a tool for collecting student health literacy data. In addition, the level of difficulty of the questions also affects the differentiating power of the items. Differentiating power is done to see how far each item can detect differences in the ability of students who have high ability levels and low ability levels (Pantiwati et al., 2022). Table 13 present the results of the differentiation test on the instrument developed. Based on Table 13, the question items number 1 to 5 have a good differentiation value and items 7 to 9 have enough value.

3.5 Evaluation

At this stage, improvements are implemented based on recommendations and feedback provided by experts. The suggestions and input received for the instrument being developed focused on material on the human renal excretory system, especially language in combining aspects of health literacy with biological material. This improvement aims to strengthen understanding of health literacy in everyday life through contextual learning for students.

4. Discussion

Health literacy is something that is not yet widely implemented in school learning. One of the lessons that are suitable for health literacy is biology, which has a lot to do with human body systems. One of them is the excretory system in the human kidney. It is important to improve health literacy about the human kidney excretory system, considering that kidney failure is the second leading cause of death in the world, as explained in the introduction.

In the context of this research, health literacy is a parameter of students' level of knowledge about the health of the human renal excretory system. To measure health literacy, of course, appropriate instruments are needed. However, the instruments that have been developed so far are general health literacy instruments that have not been linked to subjects. Therefore, it is important to develop this instrument.

The developed instrument includes 3 aspects of education, namely attitudes, skills and knowledge. This refers to PISA, which identifies 3 main dimensions of literacy in its measurement, namely (1) scientific process competence (skills), (2) scientific content/knowledge, and (3) students' attitudes toward science (OECD, 2019). By using the human kidney health literacy instrument, teachers can specifically find out the level of students' health literacy from these 3 dimensions.

The results of the material expert validation are shown in Table 8. The results of the material expert validation show that the developed tool is very feasible in terms of material. In the aspect of supporting presentation, namely images, a percentage of 80% was obtained with a very feasible category. This percentage is the lowest value obtained from the other 4 aspects. According to the validator, the supporting images need to be improved, namely clarified and enlarged. The aspect of content feasibility needs improvement in the question of knowledge aspect number 4, namely changing the term "reabsorption" to "concentration". The change is made because, according to the validator, the process that takes place in the vasa vasorum is not reabsorption, but rather the process of concentrating urine fluid through several stages of bioprocessing in the vasa vasorum. The overall score was 98% with a very feasible category. This shows that the developed device is feasible and can be used with revision.

The results of the linguist validation can be seen in table 9. The table shows that language validation in the aspects of straightforwardness obtained a percentage of 96%. This percentage is the lowest score of the other 2 aspects. This is because the indicator of the suitability of the sentence structure with Indonesian language rules obtained a score of 4 (Good) which is the lowest score of a total of 10 assessment items. That is because according to the validator there are several statements that are not in accordance with Indonesian language rules, namely there is no SPO (Subject, Predikat/verb, and Object) element. According to Munirah and Hardian, (2016), the application of sentence structure in

Indonesian must be applied in the formal education environment. This is due to the position and function of Indonesian as the language of instruction in the world of education. The correct Indonesian sentence structure aims to help students develop the ability to communicate various concepts, both orally and in writing.

After being declared valid by experts. The instrument was then tested empirically on 47 students of class The validity results of the questions are presented in table 10. Based on this table, it can be seen that there are 16 statement items that can be used as data collection tools. Although there are 2 items that cannot be used because they are invalid, namely question items number 5 and 7. However, this is not a problem because 92% of the statement items are declared valid, so they can be directly used to measure health literacy. A good evaluation test has characteristics and properties of several things that must be met, namely that the instrument must be valid or valid. A test instrument is said to be good if the instrument can accurately measure what is to be measured (Solichin, 2017). The results of the item validity analysis are 16 items on the attitude aspect declared valid are retained and can be used for further testing and 2 invalid items were eliminated or not used for further testing.

One of the causes of invalid questions can be caused by factors from within the test itself, such as the use of question language that is too wordy and the form of questions that are complicated or not easy to understand (Mohajan, 2017). In addition, according to Boumans (2020) the suitability of the material with the statement items also needs to be considered. There are actually two choices of steps that can be an alternative to overcoming the problem of invalid questions. First, the question items can be corrected. With the improvement, it is hoped that the items that students will work on are questions that have a high validity index. The second option is to directly eliminate from the row of items.

Question items and statements that are declared valid are then continued with a reliability test. Based on table, it can be seen that the attitude and knowledge aspects have a fairly high reliability value. While the skill aspect has a sufficient reliability value. This is because the respondents' answers on the skills aspect are inconsistent. This is supported by the statement Rönkkö and Cho (2022) which states that one of the factors affecting instrument reliability is the level of difficulty of the question which plays the most dominant role in the reliability coefficient. According to Hidayah et al. (2022), this concerns the number of questions that can be answered correctly, the more difficult the questions in the test device, the greater the variation in scores obtained. Thus, the greater the reliability of the instrument. Conversely, the lower the difficulty level of a question, the smaller the reliability. Therefore, it is necessary to carry out a difficulty level test, the results of which can be seen in table 12. The table shows that the items produced are not too easy or too difficult so that they can be used as a tool for collecting student health literacy data. A good question is a question that is not too easy and not too difficult (Erfan et al., 2020). Questions that are too easy cannot provide stimulation to students to solve problems. Conversely, questions that are too difficult will cause students to become discouraged and not have the enthusiasm to try again because they are out of reach. However, according to Suwarto (2016), questions that are too difficult or easy do not mean they cannot be used. This depends on the purpose of using the question instrument. If there are too many test participants and only want to pass the best participants, questions that have a high difficulty index are chosen. Conversely, if there is a shortage of test participants, a question with a low difficulty index is presented.

The results of the differential power test were also carried out to determine the ability of the questions to differentiate students with low and high abilities. According to Puger (2017), the essence of the differentiating power of test items is that they can differentiate students who are classified as intelligent (high ability) from students who are classified as less intelligent or have low ability. This means that if the questions are given to students who are clever, the results show high achievement, and if given to students who are less clever, the results are low. A question is said to have no differentiating power if the question is tested on clever students, the results are low, but when tested on students who are less clever, the results are higher. It can also be said that the item has differentiating power

but the differentiating power is reversed, thus the differentiating power index is negative (-). less than one (-1.00). Or given to both categories of students, the results are the same. This kind of thing shows that the question item has a discriminating power index = 0.00. Thus, questions that do not have differentiating power will not produce a picture of results that correspond to students' actual abilities. Therefore, the main criterion that an item must have is positive (+) differentiating power.

The results of the different power test are presented in table 13. The data from this test shows that the items used in the instrument can be used to review student abilities. However, item number 10 has a poor differentiation index. This is because the question is too easy which results in the question losing its function to differentiate students' abilities. This too easy question is shown in the table of difficulty test results which obtained an index of 0.84 in th e easy category. Based on this data, item number 10 cannot be used or eliminated from the instrument. According to Restiyawati (2020) questions that cannot be answered correctly by all students (because they are too difficult) can be declared as bad questions. Likewise, vice versa, questions that all students can answer correctly (because they are too easy) can also be declared as bad questions. These two types of categories need to be revised if they are to be used again as questions for the next test.

5. Conclusions

Based on the results and discussion, it can be concluded that the human kidney health literacy instrument developed is declared valid and feasible to use with a total score percentage achievement of linguist validation of 98% very feasible category, and the percentage of material expert validation score of 91% with a very feasible category. The results of the empirical validation test showed that 92% of the items were declared valid. The consistency test results show a high reliability level of 0.7. This states that the kidney health literacy instrument developed is suitable for use as a data collection tool. This study produced 16 statement items on the attitude aspect, 6 items on the knowledge aspect, and items on the skill aspect. The total items produced in this study were 24 items that were valid and feasible to use as a data collection tool for human kidney health literacy skills.

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