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**EXPLORATION FACTOR ANALYSIS, VALIDITY, AND RELIABILITY TEST OF THE SELF-TRANSCENDENCE SCALE ON HIV/ AIDS PATIENTS**

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**Abstract**

**Background:** The impact of HIV/AIDS affects the patient's life, both psychologically and physiologically to lower the level of Self-transcendence. So far, the measure to determine the level of self-transcendence in HIV/AIDS patients has not been established in Indonesia.

**Objectives:** The purpose of this study is to conduct a test of the validity and reliability of self-transcendence questionnaires in HIV/AIDS patients.

**Design:** This study was conducted cross-sectional study.

**Methods:** This research was conducted in the HIV group in Semarang with a total of 100 respondents. This research was carried out in August 2020. Data is collected using the purposive sampling method in patients who meet inclusion criteria, namely patients who are undergoing ARV therapy and residing in the Semarang area, and willing to be respondents. Statistical test methods used to test the validity and reliability of questionnaires are person product movement and reliability analysis.

**Results:** The validity and reliability test using SPSS 23 software shows the entire question item has a validity result of >0.164 and the reliability test results show Cronbach's alpha 0.886 result means the entire question item in the Self-transcendence Scale questionnaire is valid and reliable.

**Conclusion:** The results showed that the Self-transcendence scale can be used to measure levels of Self-transcendence in PEOPLE with HIV/AIDS

**Keywords:** *Self-transcendence scale, exploration factor analysis validity and reliability test, HIV/ AIDS.*

**INTRODUCTION**

HIV/ AIDS patient number is increasing over the past 10 years; according to the data delivered by the United Nations Program on Acquired Immuno Deficiency Syndrome (UNAIDS) in 2018, 7.7 million people were positively infected by HIV and 500,000 people died due to AIDS (UNAIDS, 2018). HIV/AIDS patient number in Central Java in

2019 was recorded for 3,024 patients, consisted of 1,938 HIV patients, 989 AIDS patients, and 97 patients died due to AIDS (Dinas Kesehatan Provinsi Jawa Tengah, 2019).

HIV/AIDS impacts may influence the patient's life, psychologically and physiologically. A study conducted by Logie et al. demonstrated that HIV/ AIDS patients were attached to a negative stigma label from their

environments, making them to cover their health status and become introverted. (Logie et al., 2018). It caused HIV/AIDS patients to have psychological disorders, such as anxiety, sleep disorders, trauma, depression, bipolar, and schizophrenia (Umeadi, 2016; Whitney S. Ricea, Carmen H. Logieb, Tessa M. Napolesc, Melanie Walcott and, et al, 2019). Poor psychological condition and inappropriate coping strategies can worsen HIV/AIDS patients' conditions, where the majority of them had suicide attempts (Tyree, et al., 2019). Psychological burdens that do not tackled well reduce self-transcendence (Firat, 2017). Self-transcendence is vital in HIV/AIDS patients to find meanings, accept themselves, accept their past, and accept their future which are all parts of life journey (Haugan, et al., 2014).

Self-transcendence is a concept that describes individuals to obtain meanings from within, introspection abilities, and aligning the life journey process (Reed, 2014). Individuals with high self-transcendence levels can find their life meaning so they will have self-acceptance that facilitate the long-term treatment process. The self-transcendence concept is divided into four parts: a. inwardly, including self-introspection abilities, self-acceptance, find meanings, and arrange goals; b. outwardly, focusing on the relationship with the environment and others; c. temporally, understanding the past and the future positively in the present d. trans-personally, showing a high self-transcendence score and gratitude level (Fiske, 2019). Self-transcendence aims to regulate how one interacts with the environment, others, insights and behavior, sense of being accepted, having a meaningful life, and live at the present (Batthyany, 2016).

The self-transcendence scale questionnaire had been used in several predecessor studies to measure the self-transcendence level (Fresson, et al., 2017). Studies using the self-transcendence scale include a study on breast cancer patients undergoing chemotherapy, chronic renal failure patients undergoing hemodialysis, and multiple sclerosis patients (Chen, et al., 2020; Hanley, Dambrun, and

Garland, 2020; McCarthy, et al., 2018). The self-transcendence scale (STS) is suitable to measure the self-transcendence level because the questionnaire is the only self-transcendence measuring tool. STS can be utilized in various age groups, from adolescents, adulthood, and elderlies. This instrument comprises four functional scales, i.e., interpersonal, intrapersonal, transpersonal, and temporal. The self-transcendence scale has four assessment scales, i.e., score 4 declares very suitable, score 3 declares more or less suitable, score 2 declares somewhat suitable, and score 1 declares unsuitable to what patients perceive (Reed, 2014).

The precedent study suggested that the self-transcendence questionnaire had high validity and reliability test values (Reed, 2014). Despite having several studies that investigated the self-transcendence scale's validity and reliability (Farahani, et al., 2016; Kim, et al., 2012; Norberg, et al., 2015; Pena-Gayo, et al., 2018) the study in Indonesia is limited only in one study conducted in Malang by Widiastuti. This questionnaire had been used in Indonesian by Widiastuti on 30 respondents in Malang, and have not met the validity and reliability process rule for foreign language questionnaires (Widiastuti, 2019) However, due to differences in respondent characteristics between the previous and the current study, validity and reliability tests would be conducted for the first time on HIV/AIDS patients, concurrently with the instrument exploration analysis factor measurement to ensure that the questionnaire can be used as a valid, reliable, and following the validity and reliability test rule for foreign language questionnaires to measure the self-transcendence level. This study aimed to conduct an exploration factor analysis, validity test, and reliability test on the self-transcendence questionnaire on HIV/AIDS patients.

## METHODS

### *Methodology*

The study has acquired a permission from Universitas Diponegoro. The sampling technique used in the study was the purposive sampling that fulfills the inclusion criteria, i.e., respondents are patients undergoing the ARV therapy, adults, can read and write, domiciled in the Semarang area, and willing to be respondents after reading the consent form. Samples in the study amounted to 100 respondents, obtained using the Product Moment Pearson formula. A hundred HIV/AIDS patients were recruited as respondents in the cross-sectional study following the inclusion criteria. After obtaining respondents according to the inclusion criteria, respondents were given a Google form link distributed through peers in the group of YSPEKA concern HIV/AIDS in Semarang. The exploration factor analysis is a primary axis factoring that aims to discover the self-transcendence scale factor structure. The exploration factor analysis is employed if the theory or notion regarding the number or factors or which variable relates to a particular factor is a priori absent or unknown, or the researcher is free to develop or explore the data (Waltz, Strickland, and Lenz, 2016).

Before conducting the exploration factor analysis, the sample adequacy was tested using the Kaiser Meyer Oikin and Bartlett tests to determine whether the factor analysis is suitable to analyze data. Besides using Kaiser Meyer Oikin and Bartlett tests, the exploration factor analysis was conducted using the orthogonal rotation (varimax) and slanted rotation (oblimin) methods (Hair and Anderson, 2013).

Validity is a test to prove the extent of a measuring tool's work. The validity test is assessed through content and construct item measurement using a factor analysis and convergent validity approach (Adamson, K. A. and Prion, 2013). There are four types of validity, i.e., face validity, construct validity, and content validity (Taherdoost, 2018). This study used two tests of construct

validity and content validity. The validity test in the study was conducted once. It was because the validity test results on the first attempt obtained a satisfying result, i.e., 15 of 15 questions were declared valid. The validity test can be repeated if the results are not satisfying or not meeting the researcher's expectation (Taherdoost, 2018).

Reliability can be measured using four different methods, i.e., reliability test-retest, an internal consistency method using Cronbach's alpha and its variations, split half method, and parallel platform method. The study used the internal consistency reliability method of Cronbach's alpha. The method was selected because the researchers only conducted one-time test; therefore, no repetition was required and problems could be avoided (Livingston, 2018; Waltz, et al., 2016).

The validity and reliability tests were carried out using the IBM SPSS Statistic 23. The validity type measured in the study was the construct validity. The reliability type measured was the internal consistency reliability. The Pearson product movement validity test used a bivariate analysis, and the reliability test used the reliability analysis. Item validity is determined by  $r_{table} > 0.361$ , adjusted to the number of respondents, i.e., 100 people. The instrument reliability was calculated using the Cronbach's alpha formula. Item is declared reliable if  $r_{11} \geq 0.700$  (Taherdoost, 2018).

### *Sample/ Participants*

The population in this study were people with HIV / AIDS who are members of YSPEKA in Semarang. The total sample in this study was 100 people with HIV / AIDS. The sampling technique used was purposive sampling, with established inclusion criteria, including HIV / AIDS sufferers who are members of YSPEKA who can use the Google Form application.

### *Instrument*

The self-transcendence scale questionnaire was formulated by Professor Pamela Reed in 1986. This questionnaire

consists of 15 question items using four Likert scale assessments: 4 declares very suitable, 3 declares more or less suitable, 2 declares somewhat suitable, and 1 declares unsuitable to what patients perceive. The questionnaire reviews individual welfare factors including cognitive, creative, and spirituality within self. The total score ranges between 15-60, and the highest score shows an excellent self-transcendence level. The researchers used a translator service to translate the questionnaire from English to Indonesia. After the translation process, the questionnaire was tested by competent experts. The data collection method was performed online. The study was carried out in August 2020.

*Ethical Consideration*

The study has acquired a permission from Universitas Diponegoro number of letter 8230/UN7.5.4.2.1/DL/2020. All respondents in the study had provided with informed consent explanation. The consent form and questionnaire filling were conducted online through Google form link distributed from peers in the group.

*Characteristics of Respondents*

The respondent characteristic demographic data of HIV patients showed 59 male patients and 41 female patients. Forty-five respondents were single and 55 respondents were married.

*Sample Adequacy*

After conducting a test using the IBM SPSS 23 Statistic, obtained a KMO value of 0.9753, indicating that the factor analysis was appropriate to be used. In discovering whether each item can be used in the factor analysis, the Measure of Sampling Adequacy (MSA) test was conducted. The overall result showed over 0.5, meaning that all indicators could be used in the factor analysis. The Bartlett test obtained a value of 589.976, indicating that there was a correlation. Therefore, all assumptions were fulfilled to conduct the factor analysis.

*Exploration Factor Analysis*

The exploration factor analysis used the primary axis factoring or varimax and oblimin factor rotations to obtain a clear interpretation, simple factor structure, and easy to be interpreted (table 1). The results from both rotations suggested four factors which summed up to explain 63.906% variance. Each factor correlated to each other. Based on the oblimin rotation, the correlation among factors ranged from 0.533 to 0.788. It proves that self-transcendence dimensions are interrelated.

**RESULTS**

**Table 1.** Exploration Factor Analysis Pattern Matrix of Self-Transcendence Dimensions.

Item Name	Factor 1	Factor 2	Factor 3	Factor 4
<b>Interpersonal</b>				
P5	.876			
P3	.828			
P6	.792			
P8	.604			
<b>Intrapersonal</b>				
P14		.783		

Item Name	Factor 1	Factor 2	Factor 3	Factor 4
P15		.739		
P7		.059		
<b>Transpersonal</b>				
P4			.755	
P2			.705	
P13			.603	
P1			.529	
P9			.492	
<b>Temporal</b>				
P11				.781
P12				.747
P10				.577

Sources: Primary Data of Questionnaire, 2020.

#### Validity Test

Based on data processing results carried out using the IMB SPSS Statistic 23 (table 2), all question items had validity values between values of .447 on the question item "Have hobbies and interests that I enjoy" to .679 on the question item "Let others help me when I need it." Therefore, the results demonstrated a higher r value than r table of  $> .164$  and it was

concluded that all question items in the self-transcendence scale questionnaires were valid.

#### Reliability Test

The total reliability score from the self-transcendence scale questionnaire was .837 (table 3), meeting the construct reliability requirements of  $> .700$ , so that the questionnaire was declared reliable.

**Table 2.** The Results of Validity Test of the Self-Transcendence Scale Questionnaire.

No.	Question Item	Item Validity	r-table
1.	Have hobbies and interest that I enjoy.	.447	
2.	Accept myself along with age.	.501	
3.	Engage with other or my community if possible.	.495	
4.	Adjust myself appropriately to my current life condition.	.664	
5.	Adjust myself appropriately to my physical ability changes.	.584	
6.	Share my knowledge or experiences with others.	.589	
7.	Find the meaning in my past experiences.	.612	
8.	Help others in a certain way.	.518	.164
9.	Have continuous interests to learn.	.628	
10.	Able to let go of several things I once considered important.	.525	
11.	Accept death as a part of life.	.524	
12.	Find a meaning in my faith/ spiritual belief.	.470	
13.	Let others help me when I need it.	.679	
14.	Enjoy my life journey.	.602	
15.	Let go of the sense of loss in my past.	.537	

Sources: Primary Data of Questionnaire, 2020.

**Table 3.** The Results of Reliability Test of the Self-Transcendence Scale Questionnaire.

No.	Question Item	Corrected Item-Total Correlation	Cronbach's Alpha
1.	Have hobbies and interest that I enjoy.	.839	.837
2.	Accept myself along with age.	.830	
3.	Engage with other or my community if possible.	.831	
4.	Adjust myself appropriately to my current life condition.	.820	
5.	Adjust myself appropriately to my physical ability changes.	.825	
6.	Share my knowledge or experiences with others.	.825	
7.	Find the meaning in my past experiences.	.823	
8.	Help others in a certain way.	.825	
9.	Have continuous interests to learn.	.823	
10.	Able to let go of several things I once considered important.	.828	
11.	Accept death as a part of life.	.830	
12.	Find a meaning in my faith/ spiritual belief.	.835	
13.	Let others help me when I need it.	.818	
14.	Enjoy my life journey.	.824	
15.	Let go of the sense of loss in my past.	.833	

Sources: Primary Data of Questionnaire, 2020.

## DISCUSSION

The exploration factor analysis results generated four factors in the self-transcendence questionnaire. These factors are interpersonal, intrapersonal, transpersonal, and temporal. If summed up, they contributed 63.906% of the total overall variance with a minimum factor number ranged from 0.059 to 0.876. The self-transcendence scale demonstrated a good internal consistency where 15 questions were interrelated, characterizing the self-transcendence concept.

There were differences in categorizing question items into dimensions of the original version during the test; for instance, question item number 1 of “have hobbies and interests that I enjoy.” This item measures individual abilities in enjoying their hobbies and habits, where each person understands this sentence differently. On the old version of question item number 1, it was included in the interpersonal dimension. However, the analysis result of question item number 1 categorized it into the transpersonal dimension. It might be translated that the activities are carried out with other

people. Second, the question item number 10, “able to let go of several things I once considered important,” is the indication of the individual ability to move on. However, this item can be interpreted subjectively from feelings and objectively to let go of something, resulting in a result difference that included the question item number 10 into the temporal category. Item content differences in each factor was caused by assessment or understanding of each individual that generated differences between the previous study and the current self-transcendence scale study.

The self-transcendence scale had been translated into several languages, such as Persian, Spanish, Korean, and Swedish, which then tested to all respondents of the adult age group. The self-transcendence scale from all languages had undergone several stages, i.e., translation process, validity test, and reliability test. The Persian questionnaire experienced changes in indicative verb to be gerund. This modification did not alter the real meaning intended in the original questionnaire. The modification was carried out so that the



questionnaire would be more interactive and understandable using words commonly used in daily life (Farahani, et al., 2016; Kim, et al., 2012; Pena-Gayo, et al., 2018). This study involved two-stage translation process to translate the self-transcendence scale into Indonesian using a translator.

The study found the first word synonym difficulty that matched the item syntax construct to be adjusted on each item to keep the real meaning as in the original questionnaire. The item in question was question item number 10. However, the translation results implied gerund form that can be understood. In the self-transcendence theory, Reed developed this questionnaire to measure abilities from cognitive, creativity, social, spiritual, and self-introspection (Fiske, 2019). The self-transcendence theory is a fluctuation of self-abilities other than the health condition, where individuals can find their current conditions through an adaptive process with the new condition (Reed, 2014). The example was in a person with limited physical abilities in the questionnaire item 1, "have hobbies and interests that I enjoy." In the current condition, the patient has active and passive hobbies that are enjoyed after following the adaptation process. The adaptation process was influenced by cognitive intellectual.

The item number 3 regarding "Engage with others or my community if possible" explains the patient's engagement to interact with the surrounding environment or among HIV patients that affected faith and hopes because of the support from other patients in the group. This group created a supporting relationship and shared experiences about other people who had undergone the adaptation phase well to achieve a high self-transcendence level (Logie, et al., 2018). However, most of the HIV patients tended to close themselves from their surrounding of other HIV patients (Rueda, et al., 2016).

The item number 12, "Find a meaning in my faith/spiritual belief," illustrates that hopes and life meanings are closely associated with spiritual meanings that help self- acceptance

such as disability, loss, and readiness to face death. The ability to accept the condition such as in a sick condition is the function of the patient's spirituality. Spirituality and religiousness are obtained from social support from the family and religious leaders (Haugan, et al., 2014). Transcendence is an expansion of spiritual dimensions, a search of life meaning and goals. Spirituality is considered a dogmatic guideline in a particular religion group (Al-Shahri, 2016).

The Korean self-transcendence scale passed several testing stages, i.e., validity, validity, and convergent validity. The study results conducted on 157 elderly respondents generated the  $r$ -value  $> .12$ , indicating that all question items were valid. The Cronbach's alpha value of 0.860 showed that all question items were over  $r_{11}$  of 0.7; therefore, the questionnaire was declared reliable. The Korean self-transcendence scale could be used on elderly respondents to measure psychometric (Kim et al. 2012).

Validity is a test to prove the extent of a tool work. The validity test is assessed through content and construct item measurement using the factor analysis and convergent validity approach (Adamson, K. A., & Prion, 2013). There are four validity forms, i.e., face validity, construct validity, content validity (Taherdoost, 2018). This study utilized two tests, i.e., construct validity and content validity. The validity in the study was only conducted once because the first trial obtained a satisfying result where 15 of 15 questions were declared valid. The test can be repeated if the result obtained is not satisfying or not meeting the researcher's expectation (Taherdoost, 2018).

The construct validity test obtained a good result with  $r > .164$ . Overall, the study demonstrated a good validity result based on the correlation strength value of  $r > .164$ . Reliability is the value or score consistency generated. The high or low Cronbach's alpha reliability coefficient in 0.70, or better said that the tested questionnaire or measuring tool can be used with a reliability level of Reliable.

(Adamson, K. A., & Prionm 2013; Bonett, and Wright, 2015; Taber, 2018).

The study generated a Cronbach's alpha internal value of .886. It shows that the self-transcendence scale questionnaire had an adequate or advised reliability (Bonett, and Wright, 2015). The validity and reliability test results of the self-transcendence scale questionnaire conducted on adolescents and adults in Spain showed the same result of valid and reliable with a Cronbach's alpha value of .833 and validity values for all question items were over  $r = .687$  (Pena-Gayo, et al., 2018). The validity and reliability tests carried out in French adolescents with Persian language showed a valid and reliable result, with Cronbach's alpha value of .82 and validity values on all question items over  $r = .47$  (Farahani, et al., 2016). All tests conducted worldwide indicate that cultural, language, and age differences employed in the validity and reliability tests of question items in the questionnaire had no difference. Hence, the researchers recommended the self-transcendence scale questionnaire to be used as a measuring tool for patients' self-transcendence scale on each country (Fiske, 2019). Respondent characteristic differences did not alter the validity and reliability test results in several countries (Farahani, et al., 2016; Haugan, et al., 2014; Pena-Gayo, et al., 2018). The current study was limited to a particular respondent group. However, the validity and reliability test results demonstrated a valid and reliable result. Future studies may involve respondents from other religion or social groups because it can pose a different spiritual insight context (Kim et al. 2012).

## CONCLUSION

The validity and reliability test results of the self-transcendence scale questionnaire as the psychometric measuring tool was valid and reliable, and therefore, can be used on HIV/AIDS patients. The 15 items of questions include 4 questions measuring of interpersonal (P5, P3, P6 and P8), 3 questions measuring of Intrapersonal (P 14, P15 and P7), 5 questions

measuring of temporal (P4, P2, P13, P1, and P9) and 3 questions measuring of temporal (P11, P12, P10).

It is necessary to conduct more studies to understand the meaning of self-transcendence on a specific population context, such as religion or belief, age, or respondents with other chronic diseases. Thus, this questionnaire will be more applicative to be performed by nurses independently.

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## DECLARATION OF CONFLICTING INTEREST

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## AUTHOR CONTRIBUTION

**Niken Wulan Hasthi Murti:** Collecting data, analyzing data, compiling research results, conducting discussions, compiling manuscripts.

**Meira Erawati:** Assisting in the interpretation of research results, directing deeper discussions related to research results, directing the preparation of manuscripts.

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