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Effect of Care Support Treatment and Other Factors Affecting the Intention and Adherence to Antiretroviral Therapy: Path Analysis Evidence, from Malang East Java

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ABSTRACT

Background: People living with HIV/AIDS (PLWHA) are still a health problem because of the cumulative increase in the population and there is a gap in the need for services to get antiretroviral therapy (ART). Compliance with PLHIV will consume antiretroviral drugs is a form of treatment success by being influenced by several factors encouraging to act, attitudes, intentions, perceptions of behavioral control, and care, support and treatment services (CST). The purpose of this study was to analyze the effect of CST services and other factors that influence the intention and compliance of ARV therapy, using theory of planned behavior, health belief model, and path analysis.
Subjects and Method: This was a cross sectional study conducted in Malang, East Java, from September to October 2019. A sample of 200 PLWH was selected by fixed disease sampling. The dependent variable was adherence to ARV treatment. The independent variables were intention, cues to action, attitude, perceived of behavioral control (PBC), and CST service. The data were collected by questionnaire and analyzed by path analysis run on Stata 13.
Results: Adherence to ARV therapy in PLWH was directly increased by strong intention (b= 3.12; 95% CI= 2.12 to 4.12; p<0.001). CST service was directly increased adherence to ARV therapy, but it was statistically non-significant (b= 0.19; 95% CI= -0.89 to 1.28; p= 0.293). Adherence to ARV therapy was indirectly affected by strong cues to action, positive attitude, and strong PBC.
Conclusion: Adherence to ARV therapy in PLWH is directly increased by strong intention. CST service is directly increased adherence to ARV therapy, but it is statistically non-significant. Adherence to ARV therapy is indirectly affected by strong cues to action, positive attitude, and strong PBC.

Keywords: compliance, ARV therapy, PLWH, health belief model, theory of planned behavior

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BACKGROUND

Sustainable Development Goals (SDGs) state that HIV/AIDS prevention is not clearly stated in one of its objectives. This is because SDGs have more universal goals than the Millennium Development Goals (MDGs), which are to achieve health and well-being for all people (goal item three). To achieve this overarching goal, one of the targets is to end the AIDS epidemic as a public health threat in 2030 (Utami, 2018).

The United Nations Program of HIV and AIDS (UNAIDS) reports that there are three countries in Asia that are at the point of HIV infection, namely China, India, and Indonesia, which have the largest population in the world. Indonesia is the third largest country with HIV cases in the Asia

Pacific with a percentage of 18% of all cases (UNAIDS, 2018). The cumulative number of HIV/AIDS cases in Indonesia up to April 2017 was 242,699 people (SIHA, 2017). HIV incidence in Indonesia reaches 0.19 per 1,000 population (UNAIDS, 2018; World Health Statistics, 2018). The incidence is still below the global rate (0.26 per 1,000 population), but is above the average for the Southeast Asian region (0.08 per 1,000 population) (WHO, 2018). In addition, deaths from AIDS in Indonesia were also reported to increase by 68% in 2016 (WHO, 2018).

The number of HIV/AIDS cases in East Java has increased every year due to the spread and spread of the area (Quarter IV Report, 2019). According to the Malang Regency AIDS Commission (KPA) noted, in 2018 there were 2,497 people who were exposed to HIV/AIDS. This increase has been detected in recent years. As in 2016 there were 1,960 people then increased again in 2017 to 2,247 people.

PLWH compliance itself in taking ARV or antiretroviral drugs is needed as a form of successful ARV treatment. Yuni (2017) states that 61% of PLWHA consuming ARVs have a significant relationship to the psychological condition of patients. Other factors that influence PLWH compliance in taking antiretroviral (ARV) are also known as saturation, stigma, clinical stage and opportunistic infections, home distance, health insurance, economic factors, the patient's relationship with the doctor, and the patient's lifestyle.

Preliminary studies conducted by researchers at Kanjempuan Regional Hospital in Malang Regency until March 2019, obtained an accumulation of a total of 1,157 cases, of which only 445 patients received ARV therapy. Of the 445 patients who received ARV therapy in a special clinic for Care, Support and Treatment (CST), there were 35 Lost Follow-ups (LFU). From the patient visit data for March 2019, it is known that the number of patients who are LFU or not monitored is 1.12%. This number is indicated as patients who are not compliant in using ARVs.

SUBJECTS AND METHOD

1. Study Design

This was an analytic observational study with a retrospective cohort design. The study was conducted at Kanjempuan clinic, Malang regional hospital, East Java, from September to October 2019.

2. Population and Sample

The population in this study included all people with HIV / AIDS in Malang District Kanjuruhan Hospital in September - October 2019. Researchers used the fixed disease sampling method in the selection of 200 sample subjects.

3. Study Variables

The dependent variable was adherence to ARV therapy. The independent variables were cues to action, attitude, intention, perceived behavioral control (PBC, and CST services.

4. Operational Definition of Variables

ARV therapy adherence was a behavior of PLWH who is obedient and disciplined in following all instructions related to ARV treatment that is being undertaken. The data were collected by questionnaire. The measurement scale was continuous and transformed into dichotomous, coded 0= non-compliance and 1 = compliance.

Cues to action was a stimulus needed by PLWH to trigger a decision making process for health behavior to occur. The drive to act is not only from the outside/external but also from within. The data were collected by questionnaire. The measurement scale was continuous and transformed into dichotomous, coded 0= weak and 1= strong.

Attitude was the response of PLWH in the form of a positive or negative assessment related to the presence or ease of influencing adherence to ARV treatment. The data were collected by questionnaire. The measurement scale was continuous and transformed into dichotomous, coded 0= negative; 1 = positive.

Perceived behavior control was a presumption of PLWH associated with adherence to ARV treatment. The data were collected by questionnaire. The measurement scale was continuous and transformed into dichotomous, coded 0= weak; 1 = strong.

Intention was the desire made by PLWH to choose whether or not they take compliance with ARV treatment. The data were collected by questionnaire. The measurement scale was continuous and transformed into dichotomous, coded 0= weak; 1 = strong.

CST service was a special service for PLWH, not only providing counseling, testing and care related to HIV disease, but also providing treatment. The data were collected by questionnaire. The measurement scale was continuous and transformed into dichotomous, coded 0= not following the CST service; 1 = follow the CST service.

5. Data Analysis

Univariate analysis was carried out to generally describe each of the variables studied including cues to action, attitude, perceived behavioral control, and CST service.

Bivariate analysis was used to determine the effect of each independent variables on the adherence to ARV therapy. Chi-square statistical test and calculation of odds ratio (OR) with confidence level (CI) is 95%.

Multivariate analysis was used to examine the effect of more than one independent variable either directly or indirectly by path analysis.

6. Research Ethics

The protocol in this study was approved by the Health Research Ethics Committee of KANJURUHAN Hospital, Malang, East Java, Indonesia under number: 072.1/ EA.-KEPK-036/35.07.208/2019.

RESULTS

1. Sample Characteristics

The categorical data sample description describes the continuous data of each study variable including cues to action, attitude, perceived behavioral control, and CST services. The results of the description analysis were shown in Table 1

Table 1. Sample characteristics of continuous data

Independent Variable	n	Mean	SD	Min.	Max.
Adherence to ARV therapy	200	21.41	2.51	14	24
Cues to action	200	14.52	1.36	10	16
Intention	200	12.74	1.85	9	15
Attitude	200	15.72	2.00	11	18
Behavioral Control Perception	200	12.97	1.77	19	15
CST service	200	0.5	0.51	0	1

2. Univariate Analysis

Table 2 shows that as many as 136 subjects of high adherence (68%) and 64 PLWH low adherence (32%). PLWH with a strong drive to act is 139 (69.5%), while PLWH with a weak impulse to act is 61 (30.5%), PLWH with strong intentions is 124 (62%) while PLWH with weak will is as much 76 (38%). PLWH with positive attitudes were 133 (66.5%), while PLWH with negative attitudes were 67 (33.5%), PLWH with strong perceived behavior control were 120 (60%), while PLWH with weak perceived behavior control 80 (40%), who partici-

pated and did not participate in the CST services were equal.

3. Univariate Analysis

Table 2. Sample characteristics of categorical data

Characteristics	Case		Control		Total	
	N	%	n	%	n	%
Adherence to ARV therapy						
High	63	63	73	73	136	68
Low	37	37	27	27	64	32
Cues to action						
Strong	62	62	77	77	139	69.5
Weak	38	38	23	23	61	30.5
Intention						
Strong	49	49	75	75	124	62
Weak	51	51	25	25	76	38
Attitude						
Positive	68	68	65	65	133	66.5
Negative	32	32	35	35	67	33.5
PBC						
Strong	38	38	82	82	120	60
Weak	62	62	18	18	80	40
CST service						
Following CST service	37	37	63	63	100	50
Not Following CST service	27	27	73	73	100	50

3. Bivariate Analysis

Table 3 shows the results of the bivariate analysis. Table 3 shows that adherence to ARV therapy increased with strong cues to action (OR= 6.40; p<0.001), strong intention (OR= 20.22; p<0.001), positive attitude (OR= 5.39; p<0.001), and PBC (OR= 8.63; p <0.001). Table 3 shows that adherence to ARV therapy decreased with participating in CST service, but it was statistically non-significant (OR= 0.63; p= 0.130).

Table 3. Chi-square test of factors influencing adherence to ARV treatment in people living with HIV

Independent Variable	Adherence to ARV therapy				Total		OR	CI 95%	p
	No		Yes						
	n	%	n	%	n	%			
Cues to Action									
Strong	27	19.42	112	80.58	139	100	6.40	3.13-13.12	<0.001
Weak	37	60.66	24	39.34	61	100			
Intention									
Strong	12	9.68	112	90.32	124	100	20.22	8.87-47.33	<0.001
Weak	52	68.42	24	31.68	76	100			
Attitude									
Positive	26	19.55	107	80.45	133	100	5.39	2.69-10.83	<0.001
Negative	38	32.00	29	43.28	67	100			
PBC									
Strong	17	14.17	103	85.83	120	100	8.63	4.17-18.12	<0.001
Weak	47	58.75	33	41.25	80	100			
CST Services									
Following	37	37	63	63	100	100	0.63	0.33-1.20	0.130
Not following	27	27	73	73	100	100			

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4. Path Analysis

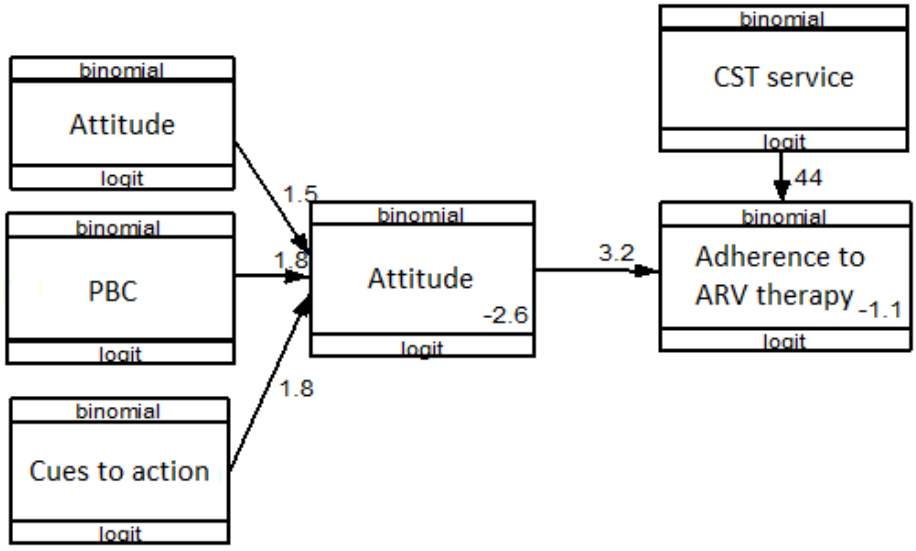

Figure 1. Path Analysis Model

Table 4. Path analysis of the factors that influence adherence to ARV treatment in people living with HIV

Dependent Variable		Independent Variable	Path Coef. (b)	CI 95%		p
				Lower Limit	Upper Limit	
Direct effect						
Compliance with	←	PDP service (receive)	0.19	-0.89	1.28	0.293
ARV treatment	←	Intention (strong)	3.12	2.12	4.12	<0.001
Indirect effect						
Intention (strong)	←	Attitude (positive)	1.53	0.74	2.32	<0.001
	←	PBC (strong)	1.81	1.03	2.58	<0.001
	←	Cues to act (strong)	1.76	0.94	2.58	<0.001
N observation= 200						
Log Likelihood= -171.04						

Figure 1 presents a path analysis diagram of the factors that influence adherence to ARV treatment in people living with HIV.

Table 4 shows the strong intention to directly influence increasing PLWH to adhere to ARV treatment (b= 3.12; 95% CI= 3.12 to 4.12; p<0.001). CST service directly affected the adherence to ARV treatment but it was statistically non-significant (b= 0.19; 95% CI= -0.89 to 1.28; p= 0.293).

Adherence to ARV therapy was indirectly affected by attitude, PBC, and cues to action through intention.

DISCUSSION

1. The effect of CST service on adherence to ARV therapy

The results of this study indicate that PDP services have not been effective in increasing adherence to ARV treatment in people living with HIV. A study by Vedhanayagam et al. (2016) in India found that there was a positive relationship between services for ARV testing and medication adherence.

CST services are a form of service where PLWH will have priority to receive care and support (UNAIDS, 2018). PLHW

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who attend PDP services increase ARV treatment compliance, in line with Leon et al. (2019) state that comprehensively, health services to increase adherence to ARV treatment have an important contribution.

2. The effect of intention on adherence to ARV therapy

A strong intention to adhere to treatment increases the likelihood of PLWH to have strong treatment intentions. The main factor of the TPB is intention, where intention becomes the control of willingness and intention is a function of three determinants in the behavior of individuals (Adita, 2014; Ajzen, 2016).

This is in line with the study of Nelsen et al. (2012) which says that knowledge about HIV and intention will influence individual behavior (Samal et al., 2011). The same thing also mentioned Mercken et al. (2011) that intention influences a person's behavior, the stronger the individual's intention to conduct the behavior, the greater the person's likelihood to control the behavior

3. The effect of attitude service on adherence to ARV therapy

A positive attitude towards medication adherence increases the likelihood of PLWH to have strong treatment intentions. Attitude is a predisposition to the action of a behavior. Attitude is divided into namely positive attitudes (the tendency of actions to approach, like an object) and negative attitudes (the tendency to stay away from, avoid, and hate certain objects) (Murti, 2018).

This is in line with a study by Adita et al. (2014) which shows the path analysis results found that attitudes have a positive and indirect relationship. Attitudes in an individual regarding ARV treatment also affect their compliance, not only that the patient's experience also contributes to ARV treatment adherence (Joglekar et al., 2011). It is important to consider attitudes that indirectly influence treatment compliance through intention when linked to an individual's knowledge of an illness (HIV / AIDS) (Zou et al, 2009).

4. The effect of PBC service on adherence to ARV therapy

The perception of strong behavioral control over medication adherence increases the likelihood of PLWHA to have strong treatment intentions. This study is in line with Conner in Saal and Kagee (2011), which states that compliance can occur if there is a perception of high behavioral control over him through the intention to comply with treatment. The results of this study are also supported by Alexandre et al. (2018) bring behavioral control perceptions to influence changes in behavior of individuals, as well as behavior in medication adherence.

PBC plays a very important role in Theory of Planed Behavior, where it refers to a person's beliefs that are influenced by internal factors (ability, skill, information possessed) and external factors (opportunities or obstacles that may be experienced) (Ajzen, 2002). PBC refers to the perception that the behavior is in someone's control (Banas et al., 2017). PBC is one of the constructs of TPB, where TPB is one of the theoretical models used to predict changes in individual behavior (Robin et al., 2011). Out of several studies that apply the TPB model, one of them is to examine the usefulness of TPB in predicting treatment adherence in African countries (Saal and Kagee, 2011).

5. The effect of cues to action on adherence to ARV therapy

The urge to act strongly on medication adherence increases the likelihood of PLWH to have strong treatment intentions. The results of this study are supported by Agustin et al. (2018), that there is a signifi-

cant relationship between the drive to act on medication adherence.

The Health Belief Model explains that individual behavior is influenced by cues to action (Sulaeman, 2016). Cues to action is one of the constructs of HBM which is an event or experience both personal (physical symptoms of health conditions) and interpersonal or environmental (media) that can motivate someone to take an action (Tarkang and Zotor, 2015). Act to action is an individual desire to take the treatment as an act of positive health behavior (medication adherence) after believing that he has the capacity to do so (Polit in Tarkang and Zotor, 2015).

AUTHORS CONTRIBUTION

Fitria Diyah Ayu Pangerti as the main author collected the data, did data analysis, and wrote the article. Pawito and Hanung Prasetya played a role in formulating the research framework.

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