

FACTORS INFLUENCING ANTIRETROVIRAL MEDICATION ADHERENCE BASED ON THE HEALTH BELIEF MODEL IN HIV/AIDS PATIENTS

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Abstract

Background: Human immunodeficiency virus (HIV) is an infection that leads to the immune system, destroys CD4 cells, and lowers a person's immunity against opportunistic infections. Therefore, antiretroviral (ARV) treatment is needed; ARV itself can slow down HIV. HBM has four dimensions that can describe how individuals believe in a healthy behavior; these dimensions include *Perceived Susceptibility, Perceived Severity, Perceived barriers, and Perceived Benefits*. **Objective:** This study aims to determine the factors that influence adherence to taking antiretroviral drugs based on the Health Belief Model. **Methods:** This research is a quantitative study using a cross-sectional design. Sampling was done by convenience sampling on HIV/AIDS patients who were in KPA Kota Bandung with a total of 184 respondents. Data analysis used person correlation, independent t-test, and one-way ANOVA and used linear regression. **Results:** The results of the study of factors affecting adherence to taking antiretroviral drugs based on the Health Belief Model using linear regression showed that there was no significant relationship between the total health belief model and adherence, but if divided by domain there was a relationship between HBM domains and adherence. **Conclusion:** Obtained a value (R²) of 0.124, which means that the effect of side effect variables, CD4 count, Perceived susceptibility, Perceived benefits, and social support on the compliance variable is 12.4% statistically significant with a value (p <0.05).

Keywords : HIV, Adherence, Antiretroviral, *Health Belief Model*.

INTRODUCTION

According to the obtained data (UNAIDS, 2022), as of 30 June 2021, 28.2 million persons had received antiretroviral therapy. In 2020, there will be 37.7 million persons living with HIV globally, with 1.5 million new infections. Six hundred eighty thousand individuals have died as a result of these diseases. AIDS will be eradicated by 2020. In 2020, as many as 37.7 million people will be living with HIV, including 36 million adults and 1.7 million children (0–14 years old).

Every year, the number of HIV/AIDS cases in Indonesia increases. Over the past eleven years, the number of HIV diagnoses in Indonesia has continued to rise. The number of cases in Papua, West Java, East Java, DKI Jakarta, and Central Java reached a peak of 50,282 in 2019. In 2017, the five provinces with the most HIV cases were also the five provinces with the most HIV cases. Patterns of HIV and AIDS infection: The majority of cases have occurred on the Indonesian island of Java, where the maximum number of cases has persisted from 2017 to 2019. Case Fatality Rate (CFR) is the proportion of disease-related fatalities relative to the number of cases. CFR From 2005 to 2019, the number of Indonesians living with AIDS declined. (Informatine, 2020).

WHO (2021) defines adherence as the behavioral actions of a person who

receives treatment follows a diet, and implements a lifestyle in accordance with the recommendations of health service providers. The root word for obedience is docile, which means discipline and submission. Last (2017) defines compliance as the patient's ability to adhere to the treatment plan, take medication at the prescribed time and frequency, and adhere to restrictions regarding diet and other medications. Abadiga et al, 2020). From several hypotheses, it can be concluded that compliance is a person's willingness to adhere to the treatment they are undergoing, be it medication or food at the prescribed time.

According to research findings (Srikartika et al., 2019), up to 51.6% of patients had high levels of compliance, while up to 29.0% had moderate compliance, and up to 19.0% had low compliance. According to (Monasel, 2020), adherence to treatment is crucial for enhancing the quality of life and preventing resistance in HIV/AIDS patients. The majority of respondents in this research had a high level of compliance, whereas those with a low level of compliance had a poor quality of life. ARV medications can help PLWHA live longer, maintain their physical health, and manage their disease more effectively. A high level of ARV adherence must suppress a substantial proportion of the virus.

Resenstock introduced HBM in 1966 (Windi Chusniah Rachmawati, S, KM., 2019), and Janz & Becker later refined it. HBM is a theory used to investigate whether an individual accepts or rejects their health condition. The HBM framework includes perceived severity or vulnerability, perceived susceptibility or severity, perceived barriers or obstacles, perceived benefits or benefits, and self-efficacy or self-efficacy. Janz and Becker added two constructs to the developing Health Belief Model, one of which is the cues to action construct, which explains the variables that motivate individuals to desire healthy behavior. From the theories above, it can be concluded that HBM is a psychological theory used to determine an individual's acceptance or rejection of their health condition. According to (Ashraf & Virk 2021) research, medication adherence is substantially positively correlated with the three components of the Health Behaviour Model. In line with previous research, linear regression analysis revealed that perceived severity, vulnerability, and barriers to engaging in HIV prevention behaviors substantially predicted medication adherence. Gaining and maintaining high treatment adherence is essential in PrEP (Pre-exposure Prophylaxis) to achieve effective reduction of HIV infections. The outcomes reveal the extent of treatment. For Men Who Have

Sex With Men (MSM) in China is not high, health professionals are attempting to increase their knowledge of the efficacy and safety of PrEP, as well as their trust in PrEP, in order to increase treatment adherence (Hu et al., 2018).

According to the findings (Abdul Kharis Sisyaheed and Soewan Indarjo, 2017), perceived barriers to ARV therapy compliance are not the cause of noncompliance. This is demonstrated by the fact that the majority of informants did not encounter significant obstacles when procuring or utilizing ARVs. By obtaining strong social support from family and health service providers, informants can reduce their understanding of obstacles. And nonadherence to ARV treatment is not due to perceived benefits. In reality, the majority of primary informants have not benefited from ARV treatment. In actuality, the opposite was felt, particularly the side effects that caused the primary informant to cease taking ARV medication after some time.

There are numerous studies on the factors that influence HIV/AIDS patients' adherence to antiretroviral medication based on the Health Belief Model. Still, they are not specific, and the results vary from study to study. In light of the Health Belief Model, researchers wish to reevaluate the factors influencing HIV/AIDS patients' adherence to antiretroviral medication.

It is anticipated that these results will aid in the development of strategies to combat nonadherence to treatment in order to prevent more serious complications and enhance the quality of life of HIV/AIDS patients.

METHODS

Study design

This research design employs a quantitative, cross-sectional, non-experimental study.

Sample

The sampling was conducted using techniques of convenience sampling. Sample measurements will be calculated using G.Power software Version 3.1.9.7 with the F test, linear multiple regression using fixed model, R² deviation from zero, effect size value 0.15, err prob value 0.05, power value 0.95, and number of predictors 12. With a minimum estimated sample size of 171 and an attrition rate of 10 to 15%, the total number of respondents is 184.

Instrument

The first section of the data instrument consists of demographic data, including age, education, gender, and occupation. The characteristics of respondents are described using data collected from respondents. The second section of clinical data includes the time of diagnosis, the duration of ARV use, and ARV adverse effects. Used to determine the respondent's condition.

The third section of the adherence instrument is (MMAS-8) or the Medication Adherence System. The eight-item Morisky Adherence Scale or the Morisky Medication Adherence Scale (MMAS-8) is a structured self-report measure of medication use. The Morisky Medication Adherence Scale (MMAS) consists of eight questions and was designed by Morisky to assess medication adherence. There are seven questions with a "Yes" or "No" response, where "Yes" scores 0 and "No" scores 1, except for question number 5, where "Yes" scores 1. For question number eight, "never" receives a score of 1, "occasionally" receives a score of 0.75, "sometimes" receives a score of 0.5, "usually" receives a score of 0.25, and "always" receives a score of 0. Total MMAS-8 scores range from 0 to 8 and are classified into three categories of compliance: high compliance (score = 8), moderate compliance (score = 6 - 8), and low compliance (score 6) (De las Cuevas & Peate, 2015).

The fourth component of the HBM Health Belief Model is assessed using the AIDS Health Belief Scale (AHBS), developed by Zagumny and Brady, to evaluate the HBM components, which are perceived severity of contracting HIV, perceived benefits of prevention methods, perceived susceptibility to contracting HIV, and Perceived barriers to engaging in HIV prevention behavior. Scaling employs a 6-point

Likert-type scale, with 'strongly concur' weighted at 6 and 'strongly disagree' weighted at 1. For each of the four subscales, higher scores indicate increased confidence. Therefore, higher scores on the four items measuring perceived vulnerability indicate a larger fear of contracting HIV. The remaining subscales for perceived severity, perceived benefits, and perceived barriers are scored similarly, with a range from 1 to 6. The AHBS score involves responses and is divided by 16. (Zagumny & Brady, 1998), a cumulative score ranges from 1 (low) to 6 (high).

The MSPSS Multidimensional Scale of Perceived Social Support questionnaire created by Gregory Zimet in 1988 will be used to evaluate the fifth section of the social support questionnaire, which is one of the variables in this study. MSPSS assesses the health-improving contributions of family, friends, and those nearest to you. The MSPSS consists of three subscales covering family, friends, and other close individuals, with a total of 12 questions answered on a Likert scale ranging from 1 to 7 (Zimet et al., 2017).

Procedure and Ethical Consideration

The Preparatory Phase. The researcher wrote a letter of introduction from the West Java STIKep PPNI campus to the Bandung City KPA, then submitted a letter of permission to conduct research in the specified location, waited for the letter to be approved, and then fulfilled the administrative requirements for research permits after obtaining research permission from the KPA. Phase of Implementation. According to the inclusion criteria, the researcher selected respondents from the Bandung City KPA who received ARV therapy using a technique known as convenience sampling. After that, the researcher obtained the respondent's informed consent. If the respondent consented, the researcher provided the respondent with a questionnaire. Last Phase of Research. The researcher reported the completion of the investigation to the Bandung City KPA.

Data analysis

Univariate analysis (presentation, frequency, mean, and standard deviation), bivariate person correlation analysis, independent t-test and One-Way ANOVA, and multivariate analysis employing linear regression.

RESULTS

Table 1 Frequency distribution based on age, gender, education, occupation, and duration of infection. Duration of ARV consumption and ARV side effects.

Variable	N (%)
Age in years	34,86 ± 8.099



(Mean ± SD)

Age	
Female	143 (77,7%)
Male	41 (22,3%)
Education	
elementary school	3 (1,6%)
Junior High School	15 (8,2%)
Senior High School	148 (80,4%)
College/Diploma	18 (9,8%)
Work	
Work	27 (14,7%)
Doesn't work	153 (83,2%)
Etc	4 (2,2%)
Long time infected	
<1 years	42 (22,8%)
1-5 years	119 (64,7%)
5-10 years	17 (9,2%)
>10 years	5 (2,7%)
Duration of ARV consumption	
<2 years	67 (36,4%)
2-5 years	98 (53,3%)
>5 years	19 (10,3%)
ARV Side Effects	
Didn't feel any side effects	71 (38,6%)
Light	71 (38,6%)
Currently	42 (22,8%)
CD4 count	
<200	15 (8,2%)
200-350	69 (37,5%)
351-500	41 (22,3%)
500-650	29 (15,8%)
>650	26 (14,1%)
Haven't checked CD4 yet	4 (2,2%)

According to the data presented in Table 1, there were significantly more male respondents (77.7%) than female respondents (22.3%). The average level of education of respondents, specifically SMA/SMK, was 148 (80.4%). The average number of unemployed respondents was 156 (83.2%). The average duration of infection for 118

(64.1%) respondents was between 1 and 5 years. The average duration of ARV use among respondents was two to five years, as reported by 98 (53.3%). On average, 71 (38.6%) respondents had no side effects, which is equivalent to 71 (38.6%) respondents who had modest side effects. The average CD4 count of respondents was 69 (37.5%).

Table 2 Descriptive analysis based on total compliance score, health belief model, and social support

Variable	Mean ± SD	Minimum – Maksimum
Total compliance score	13.71 ± 1.214	10-17
Total health belief model	55.12 ± 7.639	32-84
Score domain		
Perceived susceptibility	14.00 ± 2.758	8-24
Perceived severity	13.45 ± 3.215	4-22
Perceived benefits	20.48 ± 4.301	15-29
Perceived barriers	12.10 ± 2.446	4-20
Total social support score	24.34 ± 8.342	11-49

According to Table 2, the average total score for medication adherence among HIV/AIDS patients is 13.71 (SD = 1.214; range = 10-17). The total score from the health belief model was 55.12 (SD= 7.639; range 32-84), with Perceived benefits having the highest score (20.48; SD= 4.301; range 15-29), followed by Perceived susceptibility (14.00; SD= 2.758; range 8-24), Perceived severity (13.45; SD= 3.215; range 4-22), and Perceived barrier (12.10; DS= 2.414; range 4-20). The mean total score for social support was 24.34 (standard deviation = 8.342; range = 11-49).

Table 3 Relationship between compliance with the health belief model and social support

Variable	Person correlation	p-value
Health belief model	-0.003	0.970
Perceived susceptibility	-0.144	0.050**
Perceived severity	0.117	0.114
Perceived benefits	0.179	0.015**
Perceived barrier	0.046	0.536**
Social support	0.213	0.004

***p<0.01, **p<0.05, *p<0.1

According to Table 3, bivariate analysis using person correlation on the health belief model variable with a significance level of 0.97 and a value (p-value = 0.05) indicates that there is no significant relationship between the health belief model and ARV medication adherence in HIV/AIDS patients. The significance value of the Perceived susceptibility health belief model research is 0.050 (p-value= 0.05), indicating that there is a significant relationship between the health belief domain of the Perceived susceptibility model and ARV medication adherence in HIV/AIDS patients. The significance value of the Perceived Benefits health belief model research is 0.015 (p-value = 0.05), indicating that there is a significant relationship between the health belief domain of the Perceived Benefits model and ARV medication adherence in HIV/AIDS patients. The research on Perceived severity (p-value = 0.114) and Perceived barrier (p-value = 0.536) indicates that there is no significant relationship between the health belief domains of the Perceived severity and Perceived barrier model and adherence to taking ARV medication in HIV/AIDS patients with a p-value greater than 0.05. The results of research on social support and adherence indicate that there is a significant relationship between social support and ARV medication adherence in HIV/AIDS patients (p-value = 0.004).

Table 4 Factors associated with adherence to ARV medication in HIV/AIDS patients (n = 184)

	B	SE	Beta	t	p-value
Side effects	-1.490	0.628	-0.173	-2.373	0.019
CD4 count	1.046	0.377	0.201	2.774	0.006
<i>Perceived susceptibility</i>	-0.347	0.176	-0.114	-1.970	0.050
<i>Perceived benefits</i>	0.275	0.112	0.179	2.453	0.015
Social support	0.169	0.058	0.213	2.938	0.004

In HIV/AIDS patients, linear regression (B, SE, Beta, t, and p-value) yielded an Adjusted R Square (R²) value of 0.124, indicating that the influence of the independent variables side effects, CD4 count, Perceived susceptibility, Perceived benefits, and social support

on the dependent variable compliance was 12.4% statistically significant with a p-value of less than 0.05 (table 4).

DISCUSSION

The average Health Belief Model score was 55.12, with a standard deviation of

7.639. Based on the statistical test for person correlation, the person correlation (r) is -0.003 , and the p -value is $> (0.05)$. The results of the study indicated that there was no correlation between HIV/AIDS patients' adherence to ARV medication and the Health Belief Model. This research contradicts the findings of (Ashraf & Virk, 2021), who found that medication adherence is substantially positively correlated with the three components of the Health Belief Model. In line with previous research, linear regression analysis revealed that perceived severity, vulnerability, and barriers to engaging in HIV prevention behaviours substantially predicted medication adherence.

According to the findings of research and previous studies, the existence and absence of a relationship between the health belief model and HIV/AIDS patients' adherence to taking antiretroviral medication produced contradictory results. Previous researchers utilized the Adherence Determination Questionnaire (ADQ) with 38 questions, whereas the current researcher utilized the Medication Morisky Adherence Scale (MMAS-8) with eight questions.

Perceived susceptibility domain and HIV/AIDS patients' adherence to ARV medication. The average perceived susceptibility score, according to research, was 14.00 ($SD = 2,758$). According to the statistical test for

person correlation, the person correlation (r) is -0.144 , and the p -value is $0.050 \neq (0.05)$. In HIV/AIDS patients, there was a significant negative relationship between perceived susceptibility and adherence to taking ARV medication, as demonstrated by the study's findings. The lower the perceived susceptibility score, the greater ARV medication adherence. The results of this research are in accordance with research (Ashraf & Virk, 2021) that there is a significant relationship between perceived susceptibility and compliance with a value ($p < 0.05$).

Perceived susceptibility is a person's belief about their susceptibility to disease risk in order to engage in healthful behavior. If a person is more confident in their susceptibility to disease, they will be more likely to take preventative measures. The relationship between perceived susceptibility and adherence to taking ARV medication in HIV/AIDS patients can be concluded based on the findings of previous researchers and scientists. Perceived severity domain and ARV medication adherence in HIV/AIDS patients. The average perceived severity score was 13.45 ($SD=3.215$), according to research. According to the statistical test for person correlation, the person correlation (r) was 0.117 , and the p -value was $0.114 > (0.05)$. The results of the study indicated that there was no correlation between HIV/AIDS

patients' adherence to taking ARV medication and their perceived severity. This study's findings contradict those of a previous study (Ashraf & Virk, 2021) that found a significant correlation between perceived severity and compliance ($p=0.001$) and concluded that there is a relationship between perceived severity and compliance.

Perceived severity is an individual's perception of the disease's severity. Perceptions of disease severity are frequently based on information or knowledge of treatment, beliefs about the individual experiencing the disease's difficulty or the disease's impact on their life, or a combination of these factors. In HIV/AIDS patients, the correlation between perceived severity and antiretroviral medication adherence was inconsistent, according to the findings of research and preceding studies. The differences in results are attributable to the impact of the disease on the respondents' lives, in accordance with the limitations of the research, as respondents tend to withdraw.

Perceived benefits correlate with ARV medication adherence in HIV/AIDS patients. Based on research, the average perceived benefits score was 20.48 ($SD=4.301$). According to the statistical test for person correlation, the person correlation (r) was 0.179, and the p -value was 0.015 (0.05). Positive relationship direction and moderate

relationship strength characterize the significant relationship between perceived benefits and adherence to taking ARV medication among HIV/AIDS patients. In contrast to previous research (Ashraf & Virk, 2021) that found no correlation between perceived benefits and compliance, the results of this study were not statistically significant ($p>0.05$). Perceived benefits are a conviction in the benefits felt by an individual when engaging in healthy behavior, based on the argument that a new behavior reduces the risk of developing a disease.

In HIV/AIDS patients, perceived benefits and compliance with taking antiretroviral medication yielded varying results based on the findings of research and previous research.

Perceived barrier domain and ARV medication adherence in HIV/AIDS patients. The average perceived barrier score was 12.10 ($SD = 2.446$) based on research. According to the statistical test for person correlation, the person correlation (r) was 0.046, and the p -value was $0.536 > (0.05)$. The results of the study indicated that there was no correlation between perceived barriers and HIV/AIDS patients' adherence to taking ARV medication. This study's findings do not support the conclusion (Ashraf & Virk, 2021) that there is a significant relationship between perceived barriers and compliance results ($p=0.05$).

Perceived barriers are negative aspects of a person that prevent them from engaging in healthy behavior or perceived obstacles to making adjustments. Based on the results of research and previous studies, differing results were obtained between perceived barriers and compliance with taking antiretroviral medication in HIV/AIDS patients.

The correlation between social support and ARV medication adherence in HIV/AIDS patients. According to research, the average score for social support was 21.99 (SD = 8.489). According to the statistical test for person correlation, the person correlation (r) was -0.153, and the p -value was 0.038 (0.05). The results of the study revealed a significant correlation between social support and HIV/AIDS patients' adherence to ARV medication. This study concurs with Umah and Irawanto's (2019) conclusion that there is a correlation between social support and adherence to ART. Spiritual motivation provides profoundly positive beliefs, and the process of adapting to illness makes him aware that he is HIV-positive and compels him to adhere to taking medication to maintain stable health.

According to research findings (Mary T. Kioko & Pertet, 2017), there is a significant relationship between social support and adherence ($t=8.960$, $df=1$, $P=0.003$), with an odds ratio of 2.5 (CI 1.3 -3.6), indicating that patients with a

positive perception of social support were twice as likely to adhere to ARV medication as those with a negative perception (NH Andriyuni, 2018) Social support is a form of relationship between an individual and the people around him that can help reduce the burden of confronting problems and pressure in daily life. On the basis of the findings of previous researchers, it can be concluded that there is a relationship between social support and adherence to taking ARV medication among HIV/AIDS patients.

Limitation

Because HIV patients tend to be reclusive, the KPA employs a person in charge instead of visiting the patient directly. The patient sample was limited to a single West Java province. Consequently, the results may not be representative of PLWHA in other regions.

CONCLUSION

According to research conducted at KPA Bandung City, the research results are adapted to theory, allowing researchers to reach the following conclusions: Relationship between the Health Belief Model and HIV/AIDS patients' adherence to ARV medication. The average score on the Health Belief Model was 55.12 (SD= 7.639) with a p -value $> (0.05)$. According to the findings of the study, there is no correlation between HBM and compliance. The relationship between

social support and ARV medication adherence in HIV/AIDS patients was determined using a social support score of 21.99 (SD= 8.489) and a p-value of 0.038 (0.05). The results of the study revealed a significant correlation between social support and ARV medication adherence among HIV/AIDS patients.

11. The multivariate analysis yielded an Adjusted R Square (R²) value of 0.124, indicating that the independent variables HBM and social support had a 12.4% influence on the dependent variable compliance.

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