

Case Report Paper

Components of Herbal Plants that Inhibit HIV in Public Health Welfare Efforts: Literature Review**Sella Dwi Safitri¹, Shohebatuz Sofiyah¹**¹ *Program Study of Midwifery, Faculty of Science and Health, PGRI Adibuana University, Surabaya, Indonesia.***Article History****Received:**
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Sella Dwi Safitri

Email:
sella251100@gmail.com**This is an open access article,
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Abstract: The highest number of HIV/AIDS sufferers is of childbearing age. Stigma, discrimination, and lack of knowledge about HIV and AIDS are the biggest problems in Indonesia in an effort to reduce the prevalence of PLWHA. Most people still do not know about the causes and modes of transmission of HIV/AIDS. Predisposition is a factor that causes a mother or baby with HIV/AIDS to have a great chance of contributing to maternal and infant mortality, which greatly determines the health status of a country's population. The number of people living with HIV is increasing in 50 countries, including Indonesia, with more than 1.8 million people newly infected with this deadly virus in 2017. Around 180,000 children (0-14 years) are infected with the HIV virus and 110,000 children die from related diseases with AIDS. The purpose of this study is to provide services that can improve health, especially for mothers and children infected with the HIV virus and improve the welfare of the community from HIV/Aids disease by being able to accept their condition, be sincere, and be able to maintain relationships with the community. By using the literature review method collected through national and international journals and research articles. The result of this literature review is to obtain the latest innovations in HIV/AIDS prevention by giving herbal medicines that can play an active role in suppressing the levels of the HIV virus in the prevention of HIV/AIDS in pregnant women and their babies, through the health services provided by medical personnel and government infrastructure, is expected to reduce the rate of HIV transmission to the mother and fetus.

Keywords: Health Well-Being, HIV, SDGS.

1. Introduction

HIV (Human Immunodeficiency Virus) is the cause of AIDS (Acquired Immuno Deficiency Syndrome). AIDS is a group of symptoms that cause inability to carry out selfdefense caused by infection with the HIV virus for the human body. The United Nations Program on HIV and AIDS (UNAIDS) in its latest report shows that the number of people exposed to HIV has soared in 50 countries, one of which is Indonesia. In 2017, more than 1.8 million people were exposed to HIV/AIDS, 180 thousand children aged 0-14 years, and 110 thousand children died.

Globally, in 2017 there were 36.9 million living because of HIV, of which 1.8 million were in pregnant women, but in children less than 15 years is not known. But HIV/AIDS infection in children has decreased by 35% in 2010, where in 2010 there were 270 thousand infected with HIV then in 2017 it became 180 thousand infected. Not only that, every year 8,604 babies are infected with the HIV virus, each year the cost of care requires IDR 42 billion. The cost is for the cost of antiretroviral drugs (ARVs) who have to take the drug for the rest of their life.

2. Literature Review

The Indonesian people have succeeded in reaching Indonesia's MDG targets with 49 of the 67 MDG indicators, but there are still several indicators that must be carried out in the TPB/SDGs such as reducing maternal mortality (MMR), reducing poverty, preventing HIV/AIDS, sanitation and the availability of clean water in rural areas, and also to achieve the target of wide inter-provincial disparities [1]. One way for Indonesians to fight HIV is to increase the immune system using herbs. Herbal plants are plants that have been identified and known based on human observations to have compounds that are useful for preventing, curing diseases, performing certain biological functions, and preventing insect and fungal attacks [2].

In herbal plants found several chemical compounds that can strengthen the immune system. The immune system is the body's ability to fight infection, eliminating the work of toxins and other virulent factors that are antigenic and immunogenic. Antigen itself is a substance or compound that can stimulate the formation of antibodies. Antigens can be proteins, fats, polysaccharides, nucleic acids, lipopolysaccharides, lipoproteins and others. Meanwhile, antigenic is the nature of a compound that is able to stimulate the formation of specific antibodies against that compound [3].

3. Methodology

The writing of this literature review is based on a collection of the best international and national journals. Journals were collected through PubMed, Research Gate, Google Scholar databases. In the early stages of collected articles.

4. Finding and Discussion

Table 1 shows ingredients of each herbal.

Table 1. Herbal Ingredients, Content and Description.

| Ingredients | Content | Description |
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| Manggis Xantone | Antioksidan, Antiviral, Antifungal, Anti Bakteri | <ul style="list-style-type: none"> • Antioxidant. In the process of metabolism, oxidation and redox reactions occur so that free radicals are produced which are oxidizing agents with relative oxygen. Free radicals will oxidize substances or compounds that are beneficial to the body, so that the body's cell tissue is damaged. • Antivirals. Mangostin xanthenes contained in mangosteen peel inhibit the HIV virus replication cycle. Mangosteen peel also shows the potential to inhibit the HIV-1 protease that affects HIV replication. • Antifungal. Xanthenes also have the ability to inhibit fungal activity. Disease-causing or phytopathogenic. • Antibacterial. Several studies on the benefits of xanthenes have shown that xanthenes are |

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| | | antimicrobial against methicillinresistant staphylococcus aureus (MRSA) [4]. |
| Green tea-derived polyphenols | Polifenol, Antioksidasi, Catechins, | Green tea (<i>Camellia sinensis</i>) also has the potential to be applied as adjuvant therapy in tuberculosis and HIV patients because it has mechanisms that first-line anti-tuberculosis drugs do not have in the form of immunomodulatory potential, strong antioxidants, and inhibition of TACO gene transcription. Green tea contains polyphenolic compounds between 15-30% of its total weight. Green tea contains polyphenolic compounds consisting of flavonols, flavandiol, flavonoids and phenolic acids which are estimated to be 30% of the dry weight of tea leaves. The polyphenolic compounds found in green tea are a group of flavonols known as catechins. Green tea polyphenolic-based compounds consist of catechins (30-42%) and other elements. The antioxidant potential of green tea-derived polyphenols (GTPs) has been investigated in vitro and it is known that GTPs can scavenge free radicals and reduce the levels of other chemicals. The antioxidant potential of GTPs is much greater than that of other antioxidants, which is 10 times greater than vitamin C and 100 times greater than vitamin E and carotene. Research on GTPs has been widely carried out in cancer cases. This compound is able to inhibit tumorigenic processes with several processes, such as antioxidant, antiproliferative, and proapoptotic effects. EGCG is also known to have a significant effect on the inhibition of HIV infection and multidrug-resistant <i>Staphylococcus aureus</i> [5]. |
| 80% acetone fraction of herbal concoction 1 (IC50 38.031 µg/mL) | Antiviral | The antiviral activity of one of the herbal ingredients was higher than that of the pharmaceutical standard used for the treatment of HIV-1. It therefore displays some inhibitory potential against HIV-1 RT. There was variation in antiinflammatory activity as determined by the sPL2, 15-LOX and COX enzyme assays. The only concern about the material is the high COX-1 activity in some extracts, which is undesirable due to the mucosal protective action of the COX-1 enzyme. The toxicological results found in this study indicate that the herb, may not be toxic to human cells after consumption unless the raw herb 2 appears to exhibit a high percentage of toxicity. In addition, the data obtained showed that the herb was selectively toxic to HT-29 cancer cells than normal C3A cells. Therefore, herbal ingredients have indeed displayed valid pharmacological potential. |
| Zingiberaceae (Rimpang) | Metanol, 19S19Acetoxychavicol aetat, zerumbone | Zingiberaceae as an anti-HIV-1 agent has also been investigated, and it was found that the methanol extract of <i>Alpinia galanga</i> rhizome showed strong inhibitory activity on HIV virus replication in the protease gene (PR). Furthermore, 19S-19Acetoxychavicol acetate isolated from <i>Alpinia galanga</i> was reported to be able to block transport in the Rev. (E)-Labda-8 (17), 12-diene15,16-dial isolated from <i>Alpinia zerumbet</i> has the ability to inhibit HIV virus replication in the integrase gene. Zerumbone is the main compound of <i>Zingiber zerumbet</i> and <i>Zingiber aromaticum</i> which is also reported to be able to inhibit the replication of the HIV virus. Therefore, in this study, screening as an anti-HIV candidate was carried out in endemic plants in Sulawesi, namely Zingiberaceae, <i>Alpinia eremochlamys</i> , <i>Etlingera exuosa</i> , and <i>Etlingera</i> |

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| | | <p>acanthoides [6].</p> <p>The results of screening for antiviral activity showed that the ethanolic extract from the rhizomes of <i>E. acanthoides</i> and <i>A. eremochlamys</i> had the potential to inhibit the replication of HIV-1 virus in MT-4 cells in vitro. The rhizome of <i>E. acanthoides</i> showed the best antiviral activity with the IC50 value and the lowest level of toxicity, and the highest selectivity index among other anti-HIV candidates. Early identification of this plant chemically with GC-MS found the presence of terpenoid compounds such as zerumbone, ar-turmerone, caryophyllene, and caryophyllene oxide as well as several saturated and unsaturated fatty acids that have potential as antiviral activity [7].</p> |
| Pohon Ara (Ficus sp) | Mulberrin, morusin and sanggenol N (flavonoid) | <p>One of the plants that have potential as anti-HIV is known to come from the Moraceae family of the <i>Ficus</i> sp. This plant from the Moraceae family is known to contain mulberrin, morusin and sanggenol N from the flavonoid group to inhibit HIV replication. In addition to stem extract from the <i>Ficus glomerate</i> group which has an inhibitory test on HIV replication, in this study another Moraceae group, <i>Ficus fistulosa</i>, also showed inhibition of HIV replication in vitro. HIV infection in these cells can be observed by the presence of a cytopathic effect or changes in cell structure due to viral infection. This antiviral can be in the form of extracts from the stems, leaves, or roots. In this study, extracts from the leaves of <i>Ficus fistulosa</i> were used. From this extract, it will then be fractionated or separated based on the contents of the extract until an active ingredient is found that is effective as an anti-HIV. This antiviral is said to be effective if it has the effectiveness of inhibiting viral replication in vitro and does not have toxic properties against healthy cells (or cells that have not been infected) [8],[9].</p> <p><i>Ficus fistulosa</i> extract can inhibit HIV replication after 7 days of culture which is characterized by a reduced number of cytopathic effects observed in viral cell cultures with extracts compared to viral cell cultures alone [10].</p> |
| Temulawak | Curcumin, Xantorrizol | <p>Temulawak contains curcumin and xantorrizol which increases profilasi and differentiation of immune cells via the NFkB pathway. The activity of temulawak essential oil can also stimulate lymphocyte proliferation. Temulawak extract has high activity in inhibiting free radicals that affect the immune system. Curcumin has high antioxidant activity in reducing the number of free radicals in the body. In addition to containing curcumin, mango meeting also contains antifungal activity. Intersection mango has the strongest potential among other Zingiberaceae species. This is beneficial for people with HIV / AIDS who experience fungal infections because a decreased level of good fitness will help the cognitive abilities of PLWHA in carrying out daily activities. A person's social relationships will improve if the outlook during daily life also improves. The normal CD4+ count is 500–1000 cells/mm3 of blood. The higher the CD4+, the higher the body's ability to defend itself from complications related to HIV/AIDS, especially preventing opportunistic infections. The results showed that the immunostimulant herbal concoction gave changes to the quality of life, especially in the domains</p> |

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| <i>Nigella sativa</i> L. (jintan hitam) | thymoquinone (TQ) | of psychology, independence, and general health in HIV/AIDS sufferers in Sragen Regency and maintained CD4+ values [11],[12]. <i>Nigella sativa</i> L. (black cumin) <i>N. sativa</i> has an immunomodulatory effect. <i>N. sativa</i> seed powder can increase the ratio of T-helper lymphocytes to T-suppressors by 72% and increase the number and function of T-killer cells, while <i>N. sativa</i> oil provides an increase in the ratio of CD4 T cells against CD8 by 55% and can increase NK cell activity. In addition, the ethyl acetate fraction and the water fraction obtained through column chromatography were also known to increase the proliferative response to concovoalin-A, but not to lipopolysaccharide mitogens in B cells [8]. This indicates that the compound content of <i>N. sativa</i> oil has a good potentiating effect on T cell-mediated cellular immunity. The immunostimulating effect of <i>N. sativa</i> is estimated by increasing the cellular immune response. |
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Vertical transmission of HIV can occur from mother to baby during pregnancy, childbirth and breastfeeding. Public health efforts to prevent this transmission begin with screening pregnant women for HIV [13]. At the time of the first antenatal examination in the first trimester. The screening test uses an HIV rapid test. This rapid test is relatively inexpensive, simple and without requiring special skills so that it can be carried out by health workers (direct service providers/midwives) [14]. HIV screening for pregnant women is carried out simultaneously in an integrated antenatal care package. The national program for controlling these three direct infectious diseases is called the Mother-to-Child HIV Transmission Prevention Program (PPIA) with the aim of eliminating transmission in accordance with Minister of Health Regulation Number 52 of 2017 concerning Elimination of Mother-to-Child Transmission of HIV. Policies in the implementation of PPIA are integrated into MCH services as follows [15]:

- a. PPIA is part of the national program to control HIV, STIs, Hepatitis B and maternal and child health programs.
- b. The implementation of PPIA activities is integrated into MCH services, Family Planning (KB) and adolescent health at every level of health service's with gradual expansion involving the roles of non-government, NGOs and communities.
- c. Every woman who comes to MCH-KB services and adolescents who receive health services is given information about PPIA.
- d. At every level of MCH service, health workers at health service facilities are required to test for HIV, syphilis and hepatitis B to all pregnant women at least once as part of routine laboratory examinations during antenatal check-ups on visit 1 (K1) until delivery. This examination should be carried out at the first visit of the 1st trimester.
- e. Each city district is required to conduct orientation for clinical/midwifery health workers so that FKTP and FKRTL are able to screen for HIV, Syphilis and Hepatitis B tests.
- f. Every pregnant woman who is HIV positive, or Syphilis or Hepatitis B must be given standardized management including the provision of therapy, delivery assistance in health service facilities, breastfeeding counseling and family planning counseling.
- g. Planning for the availability of logistics (drugs and reagents) is carried out in stages starting from Health Centers, Hospitals, and District/City Health Offices to Provinces and in coordination with the Directorate General of Pegahan and Disease Control of the Ministry of Health.
- h. Valid registration based on the population identification number (NIK), NKK and domicile (PP 40/2019 article 30, Permenkes 31/2019).
- i. Monitoring, evaluation, coaching and technical supervision as well as PPIA feedback as a public health effort [2].

The latest innovation, for the inhibition of the HIV virus among the community, is the alternative use of herbal ingredients that are trusted by the community. It even becomes an option for healing efforts and is accompanied by more modern Doctor's Treatment.

5. Conclusion

To prevent the transmission of infectious diseases such as HIV, the mother to her baby can be done by early screening, namely in the first trimester of pregnancy, so that infectious diseases can be treated immediately. Some researchers conclude that infectious diseases such as HIV can be inhibited by consuming herbal medicines such as mangosteen, Greentea-derived polyphenols (GTPs) from green tea (*Camellia sinensis*), Black Seed herbal formula, and Zingiberaceae plants. If the herbal medicine is consumed in the right dosage, the drug has a significant effect on inhibiting HIV infection.

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