

THE STRATEGY TO INCREASE THE COVERAGE OF HIV TESTING AMONG ADOLESCENT: ASYSTEMATICAL LITERATURE REVIEW TO SEEK EFFECTIVE INTERVENTION

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Abstract

Background: HIV testing programs have not been able to reach all populations at risk of HIV transmission. Lodging in adolescents vulnerable to HIV, program coverage is low. The purpose of this article is to identify various models of effective interventions that can improve the coverage of HIV testing among adolescents.

Methods: This study is a systematic literature review with a time frame from 2011 to the present, with a geographical reach across the country. Rate the quality of the research methodology conducted by several components of the assessment indicators.

Results: By keyword intervention strategies, increase coverage of HIV testing and adolescents 2343 articles obtained from a number of online journals database. Screening with inclusion criteria yielded 94 articles, and by exclusion criteria obtained 13 articles. Generally, coverage of HIV testing interventions in adolescents at increased each strategy. Community-based strategies appear to be more effective based on WHO standards, with coverage achieved around 80%, compared to health facility-based strategies with an average coverage of around 50%. HIV positive number reached 16% of health facilities. While the value of the highest achievements in community based around 12%.

Conclussions:Community-based intervention is better to reach teens, but the community component must collaborate well with the ease of access to health facilities for HIV testing services. Development interventions in adolescents need to be equipped with a research method that can provide a strong evidens about the effectiveness of coverage of HIV testing among adolescents. Such research is not yet performed in Indonesia.

Keywords: *HIV, Testing, Coverage, Youth*



INTRODUCTION

New HIV infections with HIV almost 80% in adolescents aged 15-19 years in sub-Saharan Africa (UNAIDS, 2016) (idele et al., 2014). So that the estimated number of deaths from AIDS has increased by about 20% and is the leading cause of death among adolescents in Africa and the second leading cause of adolescents worldwide (Sybil, 2015). The situation of the HIV AIDS problem in adolescents in Indonesia is also important with the reporting of new infections in Indonesia reaching 30% in adolescence^{1,2}.

HIV risk behavior in adolescents has the potential to generate a new HIV epidemic (new infection). The age of instability, adolescents have a great curiosity, especially with regard to sexual activity ³Several studies have shown the proportion of sexual activity by teenagers. As many as 15% of adolescents have had sexual intercourse. Adolescent risk behavior is related to low knowledge and lack of family assistance ⁴.

The risk of incidence of HIV / AIDS due to the low knowledge of HIV in a comprehensive manner, lack of access to HIV services as well as stigma and discrimination in society⁵. Key population adolescents are a high risk group for HIV infection. The risks were related to sexual behavior risk ie without using a condom, use of injecting drug with unsterile needles and used interchangeably, sex workers, clients of sex workers and their partners, transvestites and men who sex with other men⁶. So the estimated deaths due to HIV adolescents continues to increase despite a decline in other age groups ⁷

Since 1985, HIV testing has been applied for monitoring the progress of the epidemic and the diagnosis of HIV-infected individuals. There are several HIV testing services recommended by WHO, namely Voluntary counseling and testing (VCT), provider initiated testing and counseling (PITC), Mandatory and screening ⁸. In general, only a small proportion of adolescents and young people at high risk are tested for HIV. in

most countries survey results show that less than 50% of adolescents take HIV testing and know their status. The most important cause is the possibility of the misperception that adolescents have a low risk, do not know where to take an HIV test, do not have the cost of an HIV test, fear of stigma and discrimination, and so on ⁹.

HIV testing was not enough to reach all populations. HIV testing services that have been running show that the prevalence of access is still low among adolescents ¹⁰. Several studies have shown low coverage of HIV testing in adolescents. The proportion of HIV test coverage is still around 50% of the population, despite the availability of HIV service facilities ^{11,12}. In addition to the adolescent population in general, vulnerable youth populations such as Gay, Bisexual, and Queer youth also show low coverage of HIV testing services ¹³. In Indonesia, the coverage of HIV testing in 2011 among key population adolescents (aged 15-19 years) who use needles is around 9.2%. For transgender 24.1%, MSM 19.8%. And in 2015, IDU was around 14.3%, transgender was 8.7% and MSM was 31.3% ¹⁴.

The existing intervention strategies are not yet in accordance with the characteristics for all populations, especially for adolescents who have different characteristics and risky behavior from adults. So that the nature and risky behavior of adolescents requires the availability of health care services for adolescents that can meet the health needs of adolescents and requires the right strategy to increase the coverage of HIV testing in adolescents ¹⁵. The aim of this article is to identify appropriate intervention strategies to increase the coverage of HIV testing capable of early detection of HIV positive among adolescents.

METHODS

Search strategy and study inclusions

This study is a systematic review of the literature search electronically complete

for the last 10 years the journal published by the limitations years starting from the year 2011 until 2021. Performed by identifying facts intervention strategies of the various methods of research is Cross Sectional Survey, Retrospektive cross sectional, Community Randomized Trial, and a cluster randomized controlled trial. Electronic data search was carried out in September-November 2017 with various sites as data sources. The opening of the site was initiated by opening the PMC PubMed, OPAC, and Science Direct pages. Then another site was opened with pages related to health substances such as Elseiver, BMJ, Lancet infectious D, Plosmedicine, especially pages related to AIDS such as AIDS patient care and so on. And after that enter the keywords, namely intervention strategies, increasing coverage of HIV testing and adolescents to be able to enter and access the page.

Inclusion criteria for entering the desired library is 1) the subject is composed of adolescents aged 10-32 years (adolescent phase of beginning, middle and end). 2) Articles in the form of research results from the keywords used. 3) articles published from July 2011 to August 2021. Keywords are intervention strategy, HIV test coverage, adolescents. The exclusion criteria were articles with the keywords above, however 1) targeting the general population (not adolescents) or specific youth populations (ex. Specific gender or key population only), 2) did not discuss strategies to increase HIV testing coverage. 3) articles other than English and Indonesian.

Defenition of outcomes

The outcome definition consisted of 1) coverage of the proportion of HIV-AIDS tests with the number of people who tested for HIV after the intervention divided by the number of eligible people. 2) HIV positive prevalence was obtained from the results of HIV tests conducted at the time of the study. 3) HIV testing strategy is a method used by

the community to get HIV AIDS testing and counseling facilities.

The test strategy in this study is divided into two parts, namely a community-based strategy and a clinic / health facility-based strategy. Community-based strategy means that the main target is obtained from the general public (active). Whereas the clinic-based strategy / health care targets patients who come to the clinic / health care or voluntarily come to the clinic / health care (passive) 4) the effectiveness of the strategy is measured by comparison of coverage standards based on research results and coverage standards based on WHO.

Data extraction

All references which have been found to be managed by using software Mendeley. Data extraction and analysis of each article carried by the authors themselves by considering the study design, study procedures, as well as the type of intervention strategy that is used, and the article must discuss the matter which is the goal in this article. Quality assessment on the findings of the article carried by researcher.

Quality Assesment

Assessment of the quality of research assessed using standard criteria to test misclassification, selection and reporting by evaluating the following factors: Strategy sampling, adequacy of the sample, Anticipation Bias, Focus the intervention and comparison groups, Analysis, Compliance statistical tests, Description of interventional procedures, Determination of criteria inclusion and exclusion, limitations of research and reporting of outcome data. Study quality was classified accordingly: high (score 8 to 10), moderate (score 5 to 7) or low (score 4 to 0).

Data analysis

Results were analyzed by thematic and prepared in accordance with the analysis of



the theme and arranged in the form of papers that narrative. For article search results, the Preferred Reporting Items for Systematic Reviews & Meta Analysis (PRISMA) instrument was used and a flowchart prepared based on the PRISMA 2009 checklist guidelines, sequentially setting aside articles that do not match by using the identified, screened, eligibility and criteria sequentially. expected download of the article. This study will be analyzed using a meta-synthesis approach. The recruited articles are heterogeneous so that an approach with meta-analysis cannot be carried out.

RESULTS

A total of 2343 articles were found with key words on intervention strategies, increasing coverage of HIV testing, and adolescents. Duplicate selection and open access obtained 1884 articles then screened by entering inclusion criteria, the remaining 94 articles abstract view and with the exclusion criteria to 13 articles full paper view. and furthermore, considering the findings of articles that illustrate the objectives of this

study, in the end there are 8 articles that meet all the requirements.

There are 8 articles are largely derived from the African continent and the United States and one from Thailand qualified to discuss the purpose of the research article. Most studies used intervention method to see the coverage of HIV testing based on the strategy used. And basically the strategy that is used in comparison with other strategies or test coverage of programs already running. The 8 studies analyzed consisted of various HIV testing strategy procedures especially in adolescents. Two studies used a test strategy with clinical patient subjects and 4 studies used community subjects as research targets. HIV testing strategy consists of Network-Based Strategy, Home Based Testing, PITC, Randomized Community Based, Family Planning Clinic, Hybrid mobile strategy, routine HIV testing and Community Based & Health testing (Table 2)

Table 1. Research Characteristic

No	Author/Year	Article	Location	Research method	Sampling	Type strategy	Quality evidence
1	Cherrie B,et.al/2014	Network Based Strategi	USA	Cross sectional	Not mentioned	Community based	Low
2	Niklaus Daniel,et.al/2014	Home Based Testing	Afrika	Cluster Randomized Trial	Cluster Random	Community based	High
3	Victoria simms,et.al/2017	PITC	Afrika	Cross sectional survey	Census sampling area	Clinical based	Low
4	Michael Sweat,et.al/2011	Randomized Community Based	Afrika	Community Randomized Trial	Not mentioned	Community based	High
5	Ruth S.,et.al/2016	Family Planning Clinic	USA	Cross sectional	Not mentioned	Clinical based	Low
6	Kevin Kadede,et.al/2016	Hybrid mobile strategy	Afrika	Cross sectional survey	Not Mentioned	Community based	Low



7	Lynn Ramirez,et.al/2012	Routine HIV testing	Afrika	Retro Cross sectional	Reviewed outpatient clinic	Clinical based	Low
8	Lindsey,et.al/2016	Community Based & Health testing	USA	Retro Cross sectional	Not Mentioned	Community based	Low

Table.2. Test coverage and positivity rate of the intervention model

No	Intervention Model	Strategy	Number of samples	HIV Test		HIV Testing Coverage	Positive Rate
				Yes	No	Post	
1	Network Based Approach	Community	1596	1595	0	50%	0,60%
2	Community Based VCT	Community	Tanzania: 6250 Zimbabwe : 10.700	Tanzania: 2341 Zimbabwe : 5437	Tanzania: 3909 Zimbabwe : 5263	Tanzania: 37% Zimbabwe : 51%	Tanzania: 3,7% Zimbabwe : 12,6%
	Standart VCT	Clinic	Tanzania: 6733 Zimbabwe : 12.150	Tanzania: 579 Zimbabwe : 602	Tanzania: 6154 Zimbabwe : 11548	Tanzania: 6% Zimbabwe : 9%	Tanzania: 6,9% Zimbabwe : 22%
3	PITC	Clinic	633	284	349	37,70%	2,60%
4	Home Based HTC	Community	1171	1083	88	92,50%	3,60%
	Mobile Clinic HTC	Community	1392	1207	185	86,70%	6,20%
5	Family Planning Clinic	Clinic	39698	34299	5399	86,40%	0,30%
6	Routine HIV Testing	Clinic	956	389	567	41%	16%
7	Hybrid Mobile (CHC&HBT)	Community	116326	98694	17632	88%	2,2%-8,6%
8	Community Health Campaign	Community	3425	3348	77	98%	2,65%

Eight studies that were reviewed using a variety of research methods. Four studies used cross sectional consisting of survey and retrospective approaches. Cross-sectional studies are used to evaluate interventions or strategies that have been implemented or have been implemented. In general, this study is used to evaluate the clinical-based strategy with a program that has been previously applied as PITC and routine testing and family planning clinics which is the integration of HTC. While network-based strategy with the development of interventions to improve the recruitment of adolescent HIV testing. Other

research methods using an intervention study in the form of three studies with experimental quasy and 1 study with Cluster Randomized Trial.

Studies with cross sectional methods generally have low quality with a range of values (0-4) because almost all biases exist in this research method. While the RCT studies and CRT have qualities that medium because almost met all the indicators. This method is generally focused on intervention, and considering all the bias that occurs. But the drawback is the randomization is not done well and there are no controls for comparison.



Strategi tes HIV

In general, the article discusses the development of community-based strategies and is compared with standard strategies or clinic / health based strategies. In terms of achieving coverage of HIV testing, studies with a community approach strategy are much more effective than clinical or health facility approaches. The programs that have been running are not effective enough to reach all populations at risk or without risk and only focus on adult and infant populations. Combating HIV in adolescents is not only enough to do an HIV test at a health clinic because it has different characteristics from adults¹⁶.

Based on a review of models of interventions used to increase coverage of HIV testing. Several community-based intervention models such as mobile hybrid, home based testing (HBT), network-based strategy intervention, mobile clinic HCT, community health campaign and community based VCT. While the clinic-based intervention that is initiated testing and counseling, family planning clinic, SVCT and routine HIV testing.

Intervention with mobile hybrid performed in combination with CHC (Community Health campaign) and HBT (Home Based testing). CHC is done by establishing Community Health Workers (CHWs) in the community. The task of the CHWs is to provide information and education related to HIV AIDS, sexual education and HIV testing. after that, they identified adolescents at risk of HIV for HIV testing. Then proceed with the HBT done teenagers easier access to an HIV test with a visit to the home of each client. With this strategy, it is effective to increase understanding regarding HIV AIDS and reduce stigma.

Intervention with a network based strategy is carried out through the recruitment of adolescents at risk for HIV testing. Basically, this network strategy uses

the principle of RDS (respondent driven sampling) which consists of alternative venue testing (AVT), namely the screening of at-risk adolescents with the GIS neighborhood system and a social and sexual network-based interviewing and HIV testing (SSNIT). Other community-based interventions that family planning clinic with a family approach to adolescent risk by health workers had been trained. The AVT strategy is more appropriate for minor population groups such as MSM, waria, IDU, and others. While SSNIT tend to be used for heterosexual risk populations.

Based on the results, strategy with the Community Health Campaign showed the highest proportion compared to other community strategies. This strategy is carried out by empowering local communities to become HIV cadres with the function of educating and recruiting at-risk youth. Other community strategy is called community-based intervention by (Kawichai et al., 2012) using a three-pronged strategy: 1) community mobilization, 2) mobile VCT and 3) post-test support service. community based mobilization is used to reduce stigma, increase awareness of HIV AIDS. While mobile VCT is intended to facilitate access to HIV testing and post-test support services aimed at providing support to the patient after the test. With this method, VCT is not placed in a public health center but an active officer to conduct VCT directly to the community.

Another study compared two community-based strategies, namely home based HCT and mobile clinic HCT. In the concept of mobile clinic, HCT describes a strategy with "community gathering". With this concept, the community is gathered and then given counseling by health workers who are supported by community leaders. While the HCT mobile clinic is a strategy that is almost the same, namely by providing health education by officers, but it is carried out individually / per family (door to door).

The strategy of family planning is an approach to family coverage strategy with a

higher proportion than other clinic-based strategies. But on the contrary in the coverage positivity rate, SVCT strategy and routine tests are more effective than Family Planning. Although the strategy with SVCT and routine tests can increase the positivity rate but based on the results of the research, coverage of HIV testing among adolescents is still low compared to adults then this strategy is not appropriate to capture an early age population.

HIV testing coverage

The proportion of HIV test coverage for each strategy is generally increased by using strategies that have been developed, particularly in community-based strategies (Table 2)

Studies with the strategy of using routine testing program (n = 3307, teen = 956) comparing the proportion of HIV testing coverage in adolescents (aged 12-17 years) and adults (18-24 years). From the results of these studies show the proportion of test coverage in adults is higher (65, 63-67%) than teenagers (41, 38-44%) with the proportion of each in boys (45, 42-48%), young women (55, 52-58%), adult men (37.35-39%) and adult women (63.61-65%).

Strategies with community-based testing campaign (n = 3425) compared the coverage of HIV testing of various age groups adolescents (10-15 years, 16-19 years and 20-24 years). The results of the study showed that the proportions of each age group were 10-15 years (6%), 16-19 years (55%) and 20-24 years (39%)¹⁷. Another strategy is Hybrid mobile testing (n = 116,326) with a combination and comparison of two strategies, namely CHC (Community Health Campaign) and HBT (Home based testing) in the 10-24 year age group. Studies show the proportion in men (86%) and women (89%)¹⁸

Merging and comparison of the two strategies (n = 1596) were also performed using Network-Based Approach namely

AVT (Venue alternative based testing) and SSNIT (strategy with a social and sexual networks referral) in the age group 13-24 years. With each of the proportion of HIV testing coverage for AVT 94.4% and 49.1% for SSNIT¹⁹. If other studies show a significant difference in results, another study in Lesotho, Africa which compares Home Based HCT and Standard HCT shows the proportion of test coverage that does not differ, namely 92.5% and 86.7%.²⁰

Another study evaluated a PITC program-based strategy and its development with clinical patient subjects. The study with the PITC basic program (n = 633 for ages 8-17 years) shows the proportion of coverage of 37.7% for all genders²¹. As for the development study, the integration of PITC into the Family Planning clinic (n = 39,698, aged <18 years) showed that the proportion of HIV testing coverage after integration increased from 75.9% in 2011 to 98.1% in 2014, with a total achievement of 86.40%²². In contrast, a study in 3 countries showed that the proportion of HIV testing in Tanzania was 37% (2,341 / 6,250) of the population in the intervention community receiving at least one HIV test, while in the control community the frequency was approximately four times lower at 9% (579 / 6,733). In Zimbabwe 51% (5,437 / 10,700) intervened in community members who tested HIV compared to 5% (602 / 12,150) of population in control communities. In Thailand 69% (7,802 / 11,290) of intervention community members received HIV testing and counseling compared with 23% (2,333 / 10,033) of control community members²³.

Positive Rate of HIV

HIV prevalence in studies comparing community and clinic-based strategies (strategies HBVCT and SVCT) shows HIV prevalence is higher in clinic-based strategies with positivity rate is respectively 3.6% and 14%. Other strategies show a positive rate that is almost equal between the community and health facilities. Clinical-based strategies

such as the routine testing strategy were found to be quite high with 16% HIV positive coverage. however, at PITC the HIV positive coverage was low at 0.3%. Meanwhile, the community-based strategy for mobile hybrid and Network Based Approach, respectively, with coverage rates of 5% and 1%.

However, different things happened to the community based strategies in the two countries (Tanzania and Zimbabwe). Tanzania had a lower HIV prevalence among members of the intervention community who received HIV testing compared to the control group (3.7% vs 6.9%, $p < 0.001$). However, because more people were tested in the intervention area, more than twice as many HIV cases were detected in the intervention compared to the control community (86 vs 40, $p < 0.001$). In Zimbabwe, the HIV prevalence among those tested from the intervention community was 12.8% compared to 22.0% testing from the control community ($p < 0.001$), and there were 693 HIV cases detected in the intervention community compared to 132 in the community. control ($p < 0.001$).

Similar findings were seen in Thailand, with HIV prevalence among observers in the intervention community 1.9% versus 3.4% among examiners in the control community ($p < 0.001$), but more cases of HIV were detected in the intervention community than in the control community (173 vs. 92, $p < 0.001$). Likewise, a study comparing Standard HCT and Homebased HCT showed a higher HIV positive coverage rate of 6.2% in SHCT compared to HBHCT, namely 3.6%. (table 2)

DISCUSSION

The special needs of adolescents cannot be addressed simply by applying evidence-based guidelines and recommendations because adolescents themselves are not a homogeneous group²⁴. Physical and psychological development

(cognitive and emotional) vary among adolescents, and differences in social and cultural factors and their evolved capacities can affect their ability to make important personal decisions and their access to HIV testing services^{25,26}. therefore, HIV testing service strategies must take into account the various needs and problems of adolescents. With the limited research related to HIV service strategies for adolescents, this study provides a reference for effective strategies in providing HIV testing services for adolescents..

This study identifies an HIV testing strategy in order to increase HIV testing coverage and HIV positive coverage in adolescents. Community-based studies show a higher effectiveness of the strategy than clinic-based (health facility) studies in terms of HIV testing coverage. The effectiveness of the strategy is measured according to WHO standards with test coverage of 80 - 90% for HIV testing service programs. The clinical-based program strategy is the routine test program and the PITC which is the WHO's recommended program. Both studies show the low effectiveness of the test strategy in reaching the adolescent population. The routine test program with the proportion of 41% unreached youths (proportion 59%) while the PITC program, there are still 38% of adolescents who have not had their status checked (proportion 62%). On the contrary, the clinical family planning strategy was able to achieve the target of 86.40%. The effectiveness of community-based programs has generally been successful in increasing the proportion of adolescent HIV testing based on WHO standards.

Achieving effective youth outreach is more effective with community strategies. This is because the biggest stigma lies in the community, both from family and society. So with positive support from both of them it will be more effective in recruiting. Meanwhile, the positivity rate is more likely to be found in health facilities. This is because patients have passed the window



period in the HIV infection stage so that when they visited a health facility for check-ups, most of them were already in the middle period of infection. This shows that a community strategy not only facilitates outreach, but can also detect HIV cases earlier, so that when they are found, most of them are still in the window period..

Search articles with different intervention strategies shows that stigma, knowledge and access to HIV testing services is a major factor inhibiting the lack of coverage of HIV testing. The results showed some community-based strategies such as hybrid mobile testing, mobile clinic, and community-based and health testing can improve their knowledge and decrease the stigma as well as easy access to HIV testing services. This proves that the integration of community-based strategies can increase the success of achieving HIV testing coverage in adolescents.

Of the various categories of youth, generally an increase in the intermediate group of adolescents (aged 16-19 years). Strategies with this approach can anticipate the occurrence of stigma and provide easy access to HIV testing without considering high-risk sexual or adolescent behavior because it reaches all adolescents, both vulnerable and at risk categories. Community-based approach will be the key to prevention and prevention of HIV / AIDS because it is effective for improving the care and treatment coverage of ART (Antiretroviral Therapy)²⁷.

. The method used from a variety of articles that discussed consist of a variety of approaches. Most used the intervention method and the other two used an observational approach. The intervention method approach is more effective at measuring or identifying differences in test coverage between the clinic and the community, compared to studies with survey and cross-sectional approaches.

In this analysis, the quality of research of RCT methods varied, ranging from very low to moderate generalized

epidemic settings and low-level epidemics. whereas the quality of evidence from observational studies was very low, attributed to serious study design limitations (no comparators), imprecision (multiple participants and events), and imbalance (self-reported behavioral outcomes, or evidence from a large proportion of the adult population).

Strenght and limitation

Literature review has access to many sources of information from various journals have been accredited. However, this review is limited literature in journals that can be accessed through the site on-line, and do not access any other literature that is gray materials.

CONCLUSION

From the 8 articles reviewed, several models of intervention programs could increase HIV testing coverage in adolescents. Several community-based intervention models such as mobile hybrid, home based testing (HBT), network-based strategy intervention, mobile clinic HCT, community health campaign and community based VCT. Meanwhile, clinic based interventions are PITC, family planning clinic, SVCT and routine HIV testing.

The main limiting factor is the low coverage of HIV testing of knowledge, stigma and access to services. Community-based strategies of research articles in general using the concept of stigma reduction with increased knowledge and concepts component accessibility of HIV testing. It can be concluded that effective reduction efforts are carried out with community-based strategies. This shows that the concept of an appropriate strategy for increasing test coverage is a strategy with a community component but still has to collaborate with health facilities in terms of easy access to HIV testing services.

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