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The effectiveness of HIV/AIDS education models for adolescents with speech disabilities

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Informed consent: written informed consent was obtained for anonymized patient information to be published in this article.

Abstract

Adolescents with disabilities deserve the best health care without discrimination. They can access gender-sensitive health care and rehabilitation. Health services include promotive, preventive, curative, and rehabilitative care. HIV and AIDS prevention in disabled people must start as soon as possible. Those with speech disabilities are encouraged to reach their full independence potential in case of an incident. This study tested an HIV/AIDS education model for speech-impaired people. At Indonesia's School of Disability, a non-randomized control group pre- and post-test design was used. In the study, 60 speech-impaired students were divided into 30 intervention and 30 control groups. Analyses used T-tests. Speech-disabled people's knowledge and attitudes improved with the virtual HIV/AIDS education model (P=0.007). Therefore, the HIV/AIDS education model should be implemented using virtual platforms to improve knowledge and attitudes, especially among speech-disabled teens. Virtual reproductive health education for children with speech disabilities improves knowledge and attitudes more than traditional methods, especially among visually impaired children.

Introduction

Research by the Advocacy Center for Women, Disabled, and Children in 2022 shows that adolescents with disabilities experience many obstacles in finding information about sexual and reproductive health.[1,2] So far, individuals with disabilities have been neglected from health program interventions, especially sexual and reproductive health, because the focus has been on non-disabled people.[3] Meanwhile, the maturity of reproductive organs and sexuality in people with disabilities is not much different from individuals who do not have disabilities. Important findings from the discussion results include: sexual and reproductive health information is important for people with disabilities.[4]

Persons with disabilities have the right to the highest attainable standard of health without discrimination because of disability. They can access gender-sensitive health services, including health-related rehabilitation.[5] Health services for persons with disabilities encompass promotion, prevention, cure, and rehabilitation.[6,7] Prevention of HIV/AIDS in people with disabilities must be initiated as early as possible. If it occurs, efforts are made to achieve the optimal level of independence, allowing individuals with speech disabilities to express their psychological and physical needs, necessitating the involvement of mothers.[8,9]

Health education for adolescents without disabilities is available in schools through the Health Information Center.[10] However, teenagers with disabilities still face challenges in accessing such education and require specialized skills tailored to their specific disabilities.[11] The Family Planning

Association in England adopts a comprehensive approach to training and support concerning sexual and reproductive health and rights for individuals with disabilities.[12]

Research conducted by Beatrix suggests that health education, especially regarding HIV/AIDS, can significantly influence knowledge about sexual behavior practices, including disease prevention, drug abuse prevention, and delaying sexual intercourse.[13] Knowledge is paramount in HIV/AIDS prevention efforts, aiming to foster a state of health characterized by complete physical, mental, and social well-being, rather than merely the absence of disease or weakness in all matters related to the reproductive system and its functions.[14-16]

Talking about HIV/AIDS prevention cannot be separated from matters of reproductive rights, sexual health, and sexual rights.[17,18] Reproductive rights are part of human rights, encompassing the right of every couple and individual to decide freely and responsibly on the number, spacing, and timing of the birth of children, and to have the information and means to do so.[19] Behavior is the result of all kinds of experiences and interactions between humans and their environment, which are manifested in the form of knowledge, attitudes, and actions and relates to their socioeconomic context.[20] Behavior constitutes an individual's response or reaction to stimuli originating from outside or within them.[21] According to Bandura, people learn through direct experience or observation. People acquire knowledge from what they read, hear, and see in the media, as well as from other people and their environment.[22,23] Children with speech disabilities are individuals who encounter disturbances or obstacles in verbal communication, thus experiencing difficulties in expressing themselves.[24] Social learning theory emphasizes observational learning as a process, where individuals learn behavior by systematically observing the rewards and punishments given to others. In observational learning, there are four stages of learning from the observation or modeling process using various media such as virtual media, books, or electronic media.[25] Therefore, this research aimed to assess the effectiveness of the HIV-AIDS education model for people with speech disabilities.

Materials and Methods

Research design

The research method utilized the quasi-experimental method. The research design employed was a "non-randomized control group pre-test and post-test design". In this design, the study involved an experimental group and a comparison group, both of which underwent a pretest before receiving a health education intervention using a module. The experimental group received education through a virtual education model, while the control group received education through a traditional book

module. The research concluded with a final test (post-test) administered to both groups to assess their knowledge and attitudes.

Study participants

The research was conducted at a Disability school in one of the cities in Indonesia. The samples in this study were 60 children with speech disability residing in one of the city areas (Bogor) who met the inclusion criteria and were not included in the exclusion criteria. The inclusion criteria were as follows: children with a speech disability who were willing to participate as respondents. The sampling technique used in this research was a non-probability sampling technique, specifically the consecutive sampling method. The research sample size was determined using the unpaired numerical comparative method with the Lameshow formula.[26] According to the formula, the required sample size was 60.00, which was rounded up to 60 samples for each group (60 samples for the intervention group and 60 samples for the control group).

Variable, instrument and data collection

The independent variable was the model of education about HIV-AIDS for people with speech disability. Meanwhile, the dependent variables were the knowledge and attitudes of the respondents before and after the implementation of the intervention, which were obtained by assessing the scores from the respondents after completing the pre- and post-tests.

The data collection technique involved asking for willingness to participate as a respondent and providing an explanation of the research procedure. This procedure included: first, filling out the pre-test sheet before implementing the intervention, and second, receiving an explanation of the intervention implementation.

In the intervention group, participants received education using a virtual education model about HIV-AIDS for children with speech disability. In contrast, the control group received a module about HIV-AIDS and then underwent evaluation with pre- and post-tests to assess their knowledge and attitudes. The data collection tool used in this study was a questionnaire consisting of 20 questions about the HIV-AIDS model, 20 questions about attitudes, and 20 questions about behavior. The model questions focused on the benefits or drawbacks of applying this educational model. The behavior questionnaire assessed the respondent's knowledge of HIV-AIDS, while the attitude questionnaire gauged the respondent's support or lack thereof for this educational model.

Data analysis

Univariate analysis entailed utilizing frequency distribution to examine the distribution of responses within each group separately. Multivariate analysis was conducted to compare the differences in knowledge between the intervention and control groups. This was achieved using the parametric test unpaired T-test, assuming a normal distribution of data, and the alternative nonparametric Mann-Whitney test, used when assumptions of normality were not met or when dealing with ordinal data.

Ethical clearance

The Health Research Ethics Commission of the Ministry of Health at Bandung's Health Polytechnic granted ethical approval for this study (No. 21/KEPK/EC/SIM/XII/2022). Each individual was informed about the study and voluntarily consented.

Results

According to Table 1, among the control group, it can be observed that 46.6% of the respondents are male and 53.4% are female. Regarding age characteristics, an equal number of respondents are in their early and late teens (50%). In terms of educational background, the majority of respondents have completed intermediate education (67%). Moreover, 73.4% of respondents had poor knowledge, while 26.6% had good knowledge. Regarding respondents' attitudes towards the HIV/AIDS education model, 60% supported the activities, while 40% did not. Additionally, the majority of respondents (70%) in the control group, which utilized book education (modules), considered the HIV/AIDS education model activities to be useful. In the intervention group, the majority of respondents are female (67%); in terms of age, most children are in the late teens category (53.4%); and regarding educational background, the majority of respondents have completed intermediate education (60%). The results of respondents' knowledge about HIV-AIDS in the intervention group indicate that 53.4% of respondents had good knowledge, while 46.6% had poor knowledge. Regarding respondents' attitudes towards the HIV-AIDS education model in the intervention group, all respondents supported the activities (100%). Furthermore, the HIV-AIDS education model revealed that almost all respondents (97%) believed that the activities of the HIV-AIDS education model were beneficial for them.

Differences in knowledge and attitudes between the control group and intervention group indicate a significant distinction ($P<0.05$) for both the knowledge variable (0.000) and the attitude variable (0.000). This suggests that the intervention implemented had a distinct impact on both aspects. Based on the results of the T-test with the HIV-AIDS education model, it is obtained that

r=0.007 (<0.05) indicates a significant relationship between the virtual model of education for persons with speech disabilities and the HIV-AIDS education model. This suggests a relationship of r=0.007 (Table 2).

Discussion

From the results of the data analysis, the mean knowledge scores were as follows: the control group obtained a value of 40.52 between pre-test and post-test, while the intervention group obtained a value of 81.27. It can be concluded that there are significant differences between the two groups, indicating a positive influence of the independent variable on the dependent variable. Specifically, the use of the HIV/AIDS virtual education model positively influenced knowledge (behavior) about reproductive health for children with speech disabilities.[27] At the beginning of the pre-test, the mean value before receiving the virtual education module in the control group was 40.52. After receiving education about reproductive health, the post-test results increased to 57.33. In the intervention group, the value before education and the virtual module of reproductive health was 41.43, which increased to 83.63 after receiving education and the virtual module.[28] The knowledge of respondents in both the control and intervention groups initially had low scores. This aligns with the findings of Bremer's (2009) research on adolescents with disabilities and their knowledge of reproductive health. The study revealed that these adolescents had a limited understanding of reproductive health, and many had not received basic reproductive health education[29].

The increase in knowledge was highly significant in the intervention group, which initially had a mean value of 40.52 and increased to 81.27 after the intervention. This is attributed to the strong informational power of learning modules, which provide ample opportunities for independent student utilization due to their systematic arrangement, engaging content, and accessibility anytime and anywhere according to student needs.[30] The intelligence quotient (IQ) of children with speech disabilities does not differ from that of typical children, although their verbal IQ scores may be lower than their performance IQ scores.[31] According to Rosaria, there was a notable difference in the intervention group that received socialization of the HIV/AIDS prevention module, showing better knowledge compared to the control group. Therefore, the utilization of virtual HIV-AIDS education modules can enhance the knowledge of children with speech disabilities about reproductive health, providing exposure to reproductive health materials not previously covered in school.[32]

Attitude of respondents

From the results of data analysis, the mean attitude scores were as follows: the control group obtained a value of 70.75 between pre-test and post-test, while in the intervention group, the value was 75.35. It can be concluded that there are significant differences between the two groups, indicating a positive influence of the independent variable on the dependent variable, namely the influence of virtual reproductive health education for children with visual disabilities on respondents' attitudes.[25] This aligns with the analysis indicating that the virtual module of reproductive health education for children with visual disabilities affects the attitude of respondents, as shown by significant differences.[31]

At the beginning of the pre-test, the control group obtained a value of 44.50. After receiving education about reproductive health, the post-test results increased to 55.45. In the intervention group, the value before education and the virtual module on reproductive health was 52.40, which increased to 82.25 after receiving education and the virtual module. The attitudes of respondents in both the control group and the intervention group initially had low scores.

In general, children with speech disabilities lag in speech-language development compared to typical children but exhibit similar attitudes.[25] Rosaria noted a significant difference in the intervention group that received socialization of the HIV/AIDS prevention module, showing a better attitude than the control group.[32] Research in Cameroon indicates that women with disabilities have a limited understanding of HIV/AIDS and low reproductive health education.[25] People with disabilities face barriers to accessing health services and information, arising from various factors such as norms, cultures, restrictive attitudes, limited services, lack of tools, weak communication skills of health workers, unavailability of buildings, marginalization in communities, illiteracy, limited education, and gender inequality.[31]

Thus, the use of a virtual model of HIV/AIDS education for speech disabilities affects attitudes. Visual acuity is an advantage for children with speech disabilities over blind children. Intelligence ability (IQ) is no different from typical children, although verbal IQ scores may be lower than performance IQ scores.[27] Using virtual educational models with attractive images and colors generates positive reactions, prompting individual behavioral responses to virtual learning.[33]

The results of the Mann-Whitney test discussion yielded a value of 0.000, indicating that the provision of an HIV-AIDS education model in the form of virtual education for speech-impaired individuals significantly impacts the knowledge and attitudes of children with speech disabilities. This aligns with the findings of the data analysis, indicating significant differences in knowledge and attitudes.

Children with speech disabilities learn effectively through visual media,[32] benefiting from good

memory skills that facilitate material retention, leading to significant score increases in both groups during the post-test. Their IQ does not differ from that of typical children, although their verbal IQ scores may be lower than their performance IQ scores.[34] Bandura's social learning theory suggests that behavior is influenced by the environment through reinforcement and observational learning, emphasizing the reciprocal relationship between behavior and the environment.[35]

Social learning interventions can effectively change attitudes toward discussing reproductive health issues. Even individuals initially disinterested in such discussions may show increased attention to reproductive health after receiving education and virtual modules.[36] This is evident from the rise in attitude scores in the post-test, indicating enhanced engagement with reproductive health topics.[37] Adolescents equipped with proper knowledge about reproductive health can make informed decisions regarding sexual relations before marriage.[38] The use of HIV/AIDS education models in the form of virtual education significantly increases attitude scores in intervention groups.

Conclusions

The virtual education model of reproductive health education for children with speech disabilities is effectively implemented to enhance the knowledge and attitudes of children with visual disabilities compared to the conventional model (using modules or books). The level of knowledge and attitudes among children with visual disabilities improved more significantly after receiving virtual education than with the conventional model (using modules or books).

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Table 1. Distribution of characteristics of the control and intervention groups.

Control group			
Variable	Category	Frequency	Percentage (%)
Gender	Male	14	46.6
	Female	31	53.4
Child's age	Early teens	15	50
	Late teens	15	50
Education	Basic (elementary school)	10	33
	Intermediate (junior high school or above)	20	67
Category knowledge	Good	8	26.6
	Not good	24	73.4
Category attitude	Support	18	60
	Less supportive	12	40
Education HIV-AIDS	Benefit	21	70
	No benefits	9	30
Intervention group			
Variable	Category	Frequency	Percentage (%)
Gender	Male	10	33
	Female	20	67

Child's age	Early teens	14	46.6
	Late teens	16	53.4
Education	Basic (elementary school)	12	40
	Intermediate (junior high school or above)	18	60
Category knowledge	Good	16	53.4
	Not good	14	46.6
Category attitude	Support	30	100
	Less supportive	0	0
Education HIV-AIDS	Benefit	29	97
	No benefits	1	3
Total		30	100

Table 2. Virtual HIV-AIDS education between control and intervention groups.

Variable	**Z**	**P-value**
Knowledge	-4.376	0.000
Attitude	-4.187	0.000
Variable	**T-test (P-value)**	**Information**
Education model	0.007	Related