Main_Manuscript

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Abstract

BACKGROUND: The rate of HIV/AIDS infection is increasing every year. The highest rates of HIV infection are among adolescents aged 15-24 years. Therefore, appropriate action is needed to prevent HIV transmission through risky behavior in adolescents.

AIM: This study aimed to determine the impact of the Kasaba Quartet card game on HIV/AIDS knowledge and self-efficacy in preventing HIV/AIDS-related risk behaviors in adolescents.

METHODS: The study used a quasi-experiment with an equivalent time-series design. The intervention in this study was a card game using the Kasaba Quartet. The card game is held three times with a one-day break. Adolescents' HIV/AIDS knowledge and self-efficacy were measured at the end of each card game. Sampling used purposive sampling with criteria including adolescents aged 12-16 years and domiciled in Bandung. A total of 30 people were involved in this study.

RESULT: After playing the Kasaba Quartet card game, the results showed that adolescents' knowledge of HIV/AIDS in the good category increased significantly by 66.7%. Likewise, adolescents' self-efficacy in the high category increased by 46.7%. The results of statistical tests using the Friedman test showed p-value = 0.000 (p-value <0.05). In other words, there is an effect of the Kasaba quartet card game on HIV knowledge and self-efficacy in preventing HIV risk behavior.

CONCLUSIONS: Thus, the Kasaba Quartet card game effectively increases knowledge of HIV/AIDS and self-efficacy in preventing risky behavior in adolescents. The study results can be used as an alternative strategy to increase knowledge and confidence in adolescents to avoid the spread of HIV/AIDS cases.

Keywords: adolescents, card games, HIV/AIDS, knowledge, self-efficacy

Introduction

Indonesia is one of the countries with the most HIV cases in Southeast Asia. The cumulative number of reported HIV cases until March 2021 is 427.201 people (Kementerian Kesehatan RI, 2021). Meanwhile, HIV cases in West Java are ranked 4th with 49,440 HIV cases (Kementerian Kesehatan RI, 2020). In 2018 Bandung was the area with the highest incidence of HIV/AIDS, with 4620 people (Dinas Kesehatan Kota Bandung, 2018). Meanwhile, the highest incidence of HIV is in the age range of 15-24 years, including adolescents.

Adolescence is a critical period in human development both physiologically, psychologically, and socially. Cognitive development in adolescents is at its peak stage. Cognitive development in adolescents includes the ability to reason abstractly, think systematically, and understand various problems within them (Pardeck & Pardeck, 2021). HIV infection in adolescents is closely related to cognitive development, knowledge, and behavior. Adolescence, which tends to explore new things, can lead to practices at risk of contracting a disease, moreover, if the teenager is not equipped with sufficient knowledge.

Lack of knowledge will encourage adolescents towards risky behavior. Several studies show that adolescents' knowledge of HIV/AIDS is not comprehensive. The inside of adolescents about HIV/AIDS with less is 48.7%, sufficient is 41%, and good is 10.3% (Hendra et al., 2017). Likewise, research on adolescent girls aged 15-24 years in Malawi found that 42.2% had comprehensive knowledge; the rest were still lacking (Mandiwa et al., 2021). Proper knowledge about HIV/AIDS is one of the factors in avoiding HIV transmission. However, the knowledge aspect does not guarantee that the person will not carry out activities that risk being infected with HIV. A person may know the cause of a disease but may not be aware of the factors that can put him at risk of contracting the disease (Edeh et al., 2021).

HIV prevention means trying to stop someone from contracting HIV. Avoiding risky behavior is influenced by developing a positive attitude towards self-protection. Meanwhile, a positive attitude is influenced by awareness of risk factors. HIV prevention can be associated with self-efficacy. Self-efficacy is defined as a person's belief in knowing his abilities, taking specific actions, overcoming situations, and being confident that he can achieve what he expects (Schnell et al., 2015; Talsma et al., 2018).

Several studies have revealed a significant negative relationship between self-efficacy and risk behavior in adolescents (Kyung et al., 2021; Peker et al., 2021). The higher the self-efficacy, the lower the risk behavior carried out by adolescents. Thus, preventive measures to reduce the intention to carry out HIV risk behaviors can increase knowledge and self-efficacy (Opoku et al., 2021; Wilandika et al., 2021).

Prevention of risky behavior in adolescents is facilitated through health education. Health education can be done individually or in groups (Hayes et al., 2021). Health education aims to increase knowledge and self-efficacy, thus forming persistent attitudes and behaviors. There are many choices of health education methods for HIV prevention. These methods include lectures, group discussions, seminars, and simulation games.

Simulation games are a method of health education that is carried out by providing certain information. This game is fun, so the presented material is easier to understand. In addition, the media used is also simple and easy to attract the attention of the game participants (Sutriyanto et al., 2016). Indah & Gamayanti (2016) found a significant

difference in health education with simulation games and lectures. Still, simulation games were more effective in increasing students' knowledge, attitudes and behavior.

In this study, the media used is the quartet card game. Quartet card games with specific topics impact students' knowledge of the issues discussed on the cards (Ayriza et al., 2021; Laila et al., 2018; Sutriyanto et al., 2016). Quartet card games can affect students' ability to identify a problem. Quartet card games improve students' knowledge comprehensively and are directed to achieve learning objectives. Quartet card games also increase students' motivation during learning (Lestari et al., 2020). In addition, students who are involved in learning through this quartet card game look more relaxed and happy (Hakim et al., 2015). Thus, this study aims to determine the effect of the Kasaba Quartet card game on HIV/AIDS knowledge and self-efficacy in preventing HIV/AIDS risk behavior in adolescents.

Methods

This study uses a quasi-experiment with an equivalent time-series design. This design applies the intervention three times with measurements at the end of the test three times. The intervention given was a quartet card game. At the initial stage, all respondents filled out a pre-test questionnaire to determine the level of knowledge and self-efficacy. Then, the respondent started the Kasaba quartet card game. After the match ended, respondents filled out a post-test questionnaire. This quartet card game is repeated two times.

The intervention carried out in this study was the Kasaba Quartet card game. This card game is called "Kasaba," which means in Indonesian, namely *"Kartu Sadar Bahaya HIV/AIDS"* or a quartet card regarding HIV/AIDS information and the dangers of HIV/AIDS infection. The Kasaba Quartet Card is a collection of cards with pictures and information explaining information about HIV/AIDS. There are 32 cards grouped into eight topics. Each topic consists of 4 cards.

The sampling technique used purposive sampling. The sample of this study is teenagers. Selection considered several inclusion criteria, such as adolescents aged 12-16 years and domiciled in Balonggede Village, Regal District, Bandung, West Java, Indonesia. A total of 30 adolescents participated in this study. In addition, the determination of the sample pays attention to the even distribution in 5 RW areas in Balonggede Village. The number of youth in each RW was determined by proportional allocation to achieve the representation of each region.

Participants divide themselves into groups of 3-5 people. The division of the group is determined based on the age range. There are eight groups in this game, and all participants filled out a knowledge and self-efficacy questionnaire 15 minutes before the game started. The game runs for 30 minutes. Researchers provide assistance and observations during the game. This observation is carried out to ensure that activities run according to procedures. The game is played once a day and then repeated for two days. All participants play a total of 3 rounds. All participants filled out the HIV prevention knowledge and self-efficacy questionnaire at the end of the game.

This study uses the HIV/AIDS Knowledge Questionnaire to measure adolescents' knowledge about HIV/AIDS. This instrument was developed by the researcher, who then

assessed the feasibility of the tool through expert judgment, validity, and reliability tests. The tool has been declared feasible and reliable, with a validity value between 0.361 – 0.777 and a reliability value of 0.819. This questionnaire assesses the understanding of basic HIV information, transmission media, mode of transmission, phase of HIV disease, non-infectious behavior, risk groups, prevention, and impact of HIV.

Meanwhile, to measure the self-efficacy of HIV prevention in adolescents using the Self-Efficacy Questionnaire for Prevention of HIV-Risk Behaviors developed by Wilandika (2017a). This questionnaire has a validity value between 0.324 – 0.642 and a reliability value of 0.803. The behavioral aspects assessed in this questionnaire include pre-marital sex, watching pornographic videos, drug use, use of needle tattoos, attitudes in dealing with sexual relations, and neglect of partner's HIV status.

Data analysis in this study used descriptive analysis to identify information about age, gender, and HIV information exposure. The effect of the Kasaba quartet card game on knowledge and self-efficacy of HIV/AIDS risk prevention was analyzed using the Friedman test. This research has received ethical approval from the Research Ethics Committee of Sekolah Tinggi Ilmu Kesehatan 'Aisyiyah Bandung Number 17/KEP.02/STIKes-AB/VII/2019.

Results

Table 1 shows the characteristics of the adolescents involved in this study. 30% of adolescents involved in this study were 14 years old, with 60% male. The teenager had never been exposed to HIV/AIDS information by 56.7%.

Table 2 shows the results of the Friedman test to determine the difference before and after the intervention. These results indicate a change of adolescent knowledge at the pre-test by 66.04 ± 16.219 to 97.40 ± 2.776. The statistical tests obtained p-value = 0.001 (p-value <0.05), which means that the Kasaba quartet card game affects adolescents' knowledge of HIV/AIDS. In addition, the self-efficacy results showed a change in HIV/AIDS risk prevention self-efficacy at the pre-test of 77.83 ± 8.667 to 97.60 ± 3.450 at the post-test. The statistical tests showed a p-value = 0.001 (p-value <0.05), which means that the Kasaba quartet card game affects adolescents' self-efficacy in preventing HIV/AIDS risk in adolescents.

Table 1. Characteristics of Adolescents Involved in Research

Characteristics	f	%
Age		
12 years	7	23.3
13 years	7	23.3
14 years	9	30.0
15 years	3	10.0
16 years	4	13.4
Gender		
Male	18	60.0
Female	12	40.0

HIV/AIDS Information Exposure		
Know	13	43.3
Do not know	17	56.7

Table 2. Friedman Analysis Test Results

Variable		Mean ± SD	*Mean Rank*	*p-value*
Knowledge of HIV/AIDS	*Pre-Test*	66.04 ± 16.22	1.10	0.001
	Post-Test 1	77.77 ± 15.65	2.00	
	Post-Test 2	91.11 ± 7.25	3.08	
	Post-Test 3	97.40 ± 2.78	3.82	
Self-efficacy	*Pre-Test*	77.83 ± 8.67	1.48	0.001
	Post-Test 1	79.97±9.56	1.72	
	Post-Test 2	92.80 ± 5.79	3.02	
	Post-Test 3	97.60 ± 3.45	3.78	

Discussion

The study results show that the Kasaba quartet card game affects HIV/AIDS knowledge and self-efficacy in preventing HIV/AIDS risk behavior. This result is indicated by a p-value of 0.001 (p-value <0.05). Card games combine role-playing activities and fun discussions (Jost & Künz, 2021). Card games have advantages over other methods. Card games can improve knowledge, attitudes, and skills and provide experience. In addition, this game is also an activity to channel pent-up feelings and can develop the talents and abilities that they already have (Kordaki & Gousiou, 2017). Thus, the Kasaba quartet card game method can be used as a form of health education to increase HIV/AIDS knowledge and self-efficacy in adolescents' prevention of HIV/AIDS risk behavior.

Impact on Knowledge of HIV/AIDS

Health education through educational games increases knowledge, attitudes, and behavior (Laila et al., 2018; Lestari et al., 2020). Card games are educational games that are appropriate if appropriately implemented. This game is easy to do with simple and attractive tools to accept the information presented on the card more readily. Ease of implementation of the game is an essential aspect of education that can to completed. Games that are easy to implement will support achieving the desired goals.

Quartet card games in groups can train each student's cognitive abilities to understand more deeply the topics discussed. This quartet card game is a fun activity, so students can play while learning. This game attracts students' attention to be involved in the education and teaching process. Similarly, Sutriyanto's research (2016) regarding health education with the Kasugi card game consists in playing activities in its implementation. The study results found that card games were proven to increase students' knowledge about healthy and living behavior, and during health counseling, students were active and enthusiastic.

Promoting knowledge about HIV/AIDS has been a significant factor in successfully preventing HIV infection. The study results on the understanding of HIV/AIDS in adolescents before being given the Kasaba quartet card game showed that most adolescents

had sufficient knowledge. Adolescents experienced a significant increase in knowledge after playing the Kasaba quartet card game. After the match, adolescents' knowledge of HIV/AIDS has an average of 97.40 ± 2.78. Learning activities trigger this increase in student knowledge carried out during the game.

Various factors generally influence knowledge. Factors that can influence knowledge about HIV/AIDS include age, gender, education, economy, religion (Demissie et al., 2019; Kene et al., 2021), experience, and exposure to information (Katushabe, 2021). Some of the youth involved in the study had received information about HIV/AIDS. The information is obtained from teachers' education provided by teachers and informal communication they get from various media or public activities. Individuals who have access to sources of information have good knowledge. Although the information obtained must come from a fixed and correct source so as not to cause misconceptions related to HIV/AIDS (Murwira et al., 2021). Proper knowledge about HIV/AIDS is an essential factor in preventing HIV/AIDS risk behavior. In this context, knowledge of HIV/AIDS is acquiring scientific facts and information regarding symptoms, modes of transmission, adverse consequences, and disease prevention strategies.

Information exposure with HIV/AIDS prevention behavior has a close relationship. Someone who understands the dangers of HIV/AIDS tends to take better preventive actions than those who have never been exposed to this information. Rilyani & Kusumaningsih (2016) said a relationship between exposure to information sources and HIV/AIDS prevention behavior. Adolescents exposed to HIV/AIDS information have a positive attitude towards HIV/AIDS prevention behavior. In addition, the teenager showed good preventive behavior.

In addition to information exposure, the age factor also affects a person's knowledge. Age will affect a person's understanding and mindset. Knowledge will increase with age. Increasing age impacts the development of a perspective and performance of a problem (Suhardi, 2021). As in his research, Estifanos et al. (2021) found that women aged 20-24 years have a better comprehensive knowledge of HIV than those under 19 years because the level of understanding of the information obtained can be appropriately processed individuals who have grown up.

However, planting information is a significant factor in understanding information. Children who get the correct information about HIV/AIDS at an early age will have a good knowledge base. Along with increasing age, the understanding of this information can develop properly. Giving information is related to memory (Suhardi, 2021). In this study, health education through the Kasaba card game also considers the memory factor in increasing knowledge. The card game is held three times with a time lag of once a day is also a factor that affects improving aspects of student knowledge.

Memory is the human ability to receive, store and produce impressions, understanding, or responses. Memory can also be interpreted as the result of an experience or a change in behavior or activity. Memory is organized knowledge and can develop (Roediger et al., 2007). Sensory memory records information that enters through the five senses. If the information is responded to, it will be transferred to the short-term memory system. The short-term memory system can store data for 30 seconds, and the short-term memory system can hold about seven pieces of data in a particular time (Bhinnety, 2008).

The memory of the stored information becomes the beginning of knowledge formation. However, because working memory only keeps a few information units, it must be repeated to maintain this memory. If there is no repetition, the information will be lost within 15 to 25 seconds, and the information will be lost (Vianus, 2021). When data is in working memory, related information in long-term memory is activated to combine the old data with the new. The reference of knowledge in long-term memory depends on the frequency of continuity. The more often an event is encountered, the stronger the relation in the memory (Roediger et al., 2007; Vianus, 2021). Thus, the frequency of the Kasaba quartet card game, which is repeated three times with a one-day break, makes information about HIV/AIDS stay in students' memories so that students' knowledge also increases.

The age of 14 years is included in the early teens. Adolescence is a transition period from childhood to adulthood, so that their curiosity is very high. Health education provided with an attractive appearance will increase adolescents' interest. This high curiosity is a practical key to increasing adolescent knowledge (Asfar & Asnaniar, 2018). Similarly, Fandakova & Gruber (2021) argue that curiosity and interest positively affect learning and memory in childhood and adolescence. The quartet card game is exciting and can increase curiosity and interest so that at the end of the card game, the knowledge related to HIV/AIDS can achieve.

Impact on Self-Efficacy Prevention of HIV-Risk Behavior

Correct and appropriate knowledge is an essential point in efforts to prevent the transmission of HIV/AIDS, especially among adolescents. However, a person's sound knowledge of HIV/AIDS prevention does not guarantee that the person will not engage in risky activities. Self-efficacy factors also influence this preventive behavior. The study results on self-efficacy in preventing HIV/AIDS risk behavior before the Kasaba quartet card game showed that most adolescents had moderate self-efficacy. After adolescents played the Kasaba card game, adolescent self-efficacy was significantly increased. Self-efficacy of HIV/AIDS prevention in adolescents after implementing the Kasaba card game in the final stage has an average of 97.60 ± 3.45.

Adolescent self-efficacy can be formed through the implementation of health education. Such is the case in Wilandika's research (2017b), which found that health education through case-based learning can increase self-efficacy in preventing HIV risk behaviors. Self-efficacy in preventing HIV-risk behavior in adolescents has increased the ability of adolescents to believe that they can and successfully take preventive action against various possible sexual behaviors that are at risk of contracting HIV infection. This increase in self-efficacy is carried out in stages by providing information about HIV/AIDS, forming permanent knowledge related to the given topic.

Risk behavior prevention self-efficacy and knowledge have a significant relationship (Mahat & Scoloveno, 2010; Rodríguez et al., 2011). Likewise, Yu et al. (2021) said HIV knowledge had been a relationship with self-efficacy and condom use intentions in adolescents. The study results found that self-efficacy is a factor that mediates the knowledge and behavioral purposes to use safety. The better the understanding, the higher a person's self-efficacy, which will affect the attitude of preventing HIV/AIDS risk behavior.

Bandura (2013) said self-efficacy affects how individuals think, feel, motivate themselves, and take action. Someone who only has knowledge, attitudes, and skills without self-efficacy is likely that that person will not take action (Urdan & Pajares, 2006). This study found that almost all adolescents, after being given the Kasaba card game intervention, nearly all adolescents had high self-efficacy in preventing HIV risk behaviors. The results of this study can be interpreted that the higher a person's self-efficacy, the higher the confidence to control HIV risk behavior. In the end, the teenager is expected to take real action in preventing various HIV risk behaviors.

Newby et al. (2021) revealed that self-efficacy is an essential determinant of health behavior. Self-efficacy will positively affect health behavior. Self-efficacy possessed by a person will make that person pay attention to behaviors that support their health. A person with high self-efficacy towards healthy behavior is most likely to carry out health care such as exercising and avoiding behaviors detrimental to that person's health (Masoompour et al., 2017; Parkinson et al., 2017). Meanwhile, someone who has low self-efficacy is likely to approach behaviors that are risky to his health.

Thus, the Kasaba quartet card game impacts increasing knowledge of HIV/AIDS in adolescents. This educational method affects increasing good adolescent knowledge about HIV/AIDS. Adolescents who have good knowledge can judge whether an action is good or bad to develop self-efficacy beliefs in themselves. Adolescent self-efficacy develops into the initial formation of behavior in avoiding the risk of HIV infection.

Conclusions

The Kasaba quartet card game affects knowledge about HIV/AIDS and self-efficacy in preventing HIV/AIDS risk behavior. Adolescents who have good knowledge affect their confidence to carry out various activities to avoid different HIV risk behaviors. Kasaba quartet card game is an effective health education to increase knowledge and self-efficacy of HIV prevention. This game uses exciting and easy card media, so teenagers are interested and enthusiastic about playing it. The Kasaba quartet card game can also increase the curiosity and motivation of teenagers to learn information about HIV/AIDS.

The results of this study become a strategy in HIV infection prevention education among adolescents. The development of this method is adjusted to the characteristics of the target to achieve the expected goals. Although in this study, the quartet card game only involved a specific age group of teenagers. Further research should be directed to analyze the effect of the Kasaba quartet card game on other age groups. The Kasaba quartet must also be redeveloped and adapted to the individual developmental stage.

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