



The Kasaba Quartet: The Impact of Card Games on Knowledge and Self-Efficacy HIV/AIDS Prevention

Angga Wilandika^{1*}, Ariani Fatmawati¹, Ghitha Farida¹, Suzana Yusuf²

¹Department of Nursing, Universitas Aisyiyah Bandung, Bandung, Indonesia; ²Centre for Nursing Studies, Universiti Teknologi MARA, Shah Alam, Malaysia

Abstract

Edited by: Sasho Stoileski

Citation: Wilandika A, Fatmawati A, Farida G, Yusuf S. The Kasaba Quartet: The Impact of Card Games on Knowledge and Self-Efficacy HIV/AIDS Prevention. Open Access Maced J Med Sci. 2022 Mar 01; 10(E):341-348. https://doi.org/10.3889/oamjms.2022.8681

Keywords: Adolescents; Card games; HIV/AIDS; Knowledge; Self-efficacy

*Correspondence: Angga Wilandika, Departement of Nursing, Universitas 'Aisyiyah Bandung, Jl. KH Ahamad Dahlan Dalam No.6 Bandung - 40264, West Java, Indonesia. E-mail: wiland.angga@unisa-bandung.ac.id

Received: 18-Jan-2022

Revised: 04-Feb-2022

Accepted: 21-Feb-2022

Copyright: © 2022 Angga Wilandika, Ariani Fatmawati, Ghitha Farida, Suzana Yusuf

Funding: This research did not receive any financial support

Competing Interests: The authors have declared that no competing interests exist

Open Access: This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)

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: The purpose of this study was to determine the effect of Kasaba Quartet card game on HIV/AIDS knowledge and self-efficacy in preventing HIV/AIDS-related risk behavior 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 was held 3 times with a 1-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.

RESULTS: After playing the Kasaba Quartet card game, the results showed that adolescents' knowledge of HIV/AIDS in the excellent category increased significantly, with average scores from 66.04 ± 16.219 to 97.40 ± 2.776 . Likewise, adolescents' self-efficacy with the high sort was raised, from 77.83 ± 8.67 to 97.60 ± 3.45 . The results of statistical tests using the Friedman test showed the significance level of 0.001 (Sig. <0.05). In other words, there was 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.

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 [1]. Meanwhile, HIV cases in West Java are ranked 4th with 49,440 HIV cases [2]. In 2018, Bandung was the area with the highest incidence of HIV/AIDS, with 4620 people [3]. Meanwhile, the highest incidence of HIV is in the age range of 15–24 years, including adolescents.

Based on data from the Public Health Offices of Bandung [4], the number of new HIV-positive sufferers in 2020 was 82 cases. New cases of AIDS in 2020 were 67 patients. Meanwhile, the HIV key population in Regol District is high. The number of HIV cases in this vital group includes injecting drug users (59 cases), female sex workers (258 cases), men who have sex with men (217 cases), and shemales (20 cases) [3]. HIV risk behavior that occurs in the community and the high incidence of HIV in this area requires every teenager to have the ability to prevent HIV infection.

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 [5]. 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 toward 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% [6]. Likewise, research on adolescent girls aged 15–24 years in Malawi found that 42.2% had comprehensive knowledge; the rest were still lacking [7]. 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. One may know the cause of the illness, but may not know the factors that may put them at risk of getting the illness [8].

HIV prevention means trying to stop someone from contracting HIV. Avoiding risky behavior is influenced by developing a positive attitude toward 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 [9], [10].

Several studies have revealed a significant negative relationship between self-efficacy and risk behavior in adolescents [11], [12]. 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 [13], [14].

Prevention of dangerous behaviors in adolescence is promoted through health education. Health education can be conducted individually or in groups [15]. 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, seminars, and simulation games.

Health education with the lecture method is the easiest method to implement and does not require complicated equipment. This method is widely used to provide information and increase knowledge, especially when using interactive lectures [16]. However, the lecture method has limitations in the process of teacher-student interaction. Several studies found that this method was considered monotonous and boring for students [17], [18].

Likewise, the seminar method has the same characteristics as lectures. Seminars have the purpose of acquiring specific knowledge. The seminar method is also considered adequate to increase students' knowledge, active learning abilities, and cooperation [19], [20]. The seminar emphasizes multi-directional interaction between students or teachers [21]. However, seminars have weaknesses such as taking a long time and increasing overload because each student has to do various preparations and assignments before the seminar is held [22]. The lecture and seminar methods are not necessarily suitable for all ages, especially teenagers, who are sometimes difficult to focus on for a long time at 1 time.

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 [23]. Indah and Gamayanti [24]

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. This deck is called "Kasaba" (*Kartu Sadar Bahaya HIV/AIDS*) or a quartet card related to HIV/AIDS information and HIV/AIDS infection risk. Quartet card games with specific topics impact students' knowledge of the issues discussed on the cards [23], [25], [26]. 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 [27]. In addition, students who are involved in learning through this quartet card game look more relaxed and happy [28]. Thus, this study aimed to determine the impact of the game Kasaba Quartet on HIV/AIDS knowledge and self-efficacy in preventing HIV/AIDS risk behaviors in adolescents.

Methods

In this study, we used a quasi-experiment with an equivalent time series design. This design applies the intervention 3 times with measurements at the end of the test 3 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 2 times.

The intervention given was in the form of a quartet card game. The quartet card game uses cards, and wherein there are four cards in one set. Each card has a main topic and four subtopics from that central topic. The total cards used are usually 32 cards [23], [26], [29], or 33 cards, including the Joker [29]. The quartet card used in this study 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. This Kasaba Quartet Card was developed independently by the researcher. 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 without the joker card. Each topic consists of four 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, Regol District,

Bandung, West Java, and Indonesia. A total of 30 adolescents participated in this study. In addition, the determination of the sample pays attention to the even distribution in five hamlets in Balonggede Village. The number of youth in each hamlet 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 min before the game started. The game runs for 30 min. 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 2 days. All participants play a total of three 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 and 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 [30]. This questionnaire has a validity value between 0.324 and 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.

In this study, the researcher applied the restriction method to control confounding factors that might affect the intervention outcome. During the 1-day break in the card game, each participant is emphasized not to repeat the information from the card. Each participant agreed not to seek or read news related to HIV/AIDS from any information source.

Data analysis in this study used descriptive analysis to identify information about age, gender, and HIV information exposure. Due to the sample abnormality and the comparison of the three data groups affecting the change in knowledge and self-efficacy of risk behavior prevention, we used the non-parametric Friedman test. This study was ethically approved by Research Ethics Committee from Sekolah

Tinggi Ilmu Kesehatan' Aisyiyah Bandung with No.17/KEP.02/STIKes-AB/VII/2019.

Results

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

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 shows the change of adolescent knowledge at the pre-test by 66.04 ± 16.219 to 97.40 ± 2.776 .

Table 2: Average score of knowledge

Variable	Mean ± SD	Mean Rank
Knowledge of HIV/AIDS		
Pre-test	66.04 ± 16.22	1.10
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

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, as shown in Table 3.

Table 3: Average score of self-efficacy

Variable	Mean ± SD	Mean Rank
Self-efficacy		
Pre-test	77.83 ± 8.67	1.48
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

The result of Friedman test is shown in Table 4. The statistical tests showed the significance level of 0.001 (Sig. <0.05), which means that the Kasaba Quartet Card game affects adolescents' self-efficacy in preventing HIV/AIDS risk in adolescents.

Table 4: Friedman analysis test results

Number	30
Chi-square statistics of Friedman test	80.045
Degrees of freedom	3
The significance level	0.001

Discussion

HIV infection among adolescents is a complicated problem and becomes a prolonged problem if it is not prevented. Prevention through education in

understanding the dangers of HIV to adolescents is necessary. 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 significance level of 0.001 (Sig. <0.05). In the last measurement, adolescents who participated in the Kasaba Quartet Card game showed an increase in knowledge and self-efficacy of HIV prevention. The application of educational interventions such as the Quartet Card game is an effort to increase adolescent understanding that can stimulate self-efficacy in preventing HIV risk behavior.

Card games combine role-playing activities and fun discussions [31]. 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 [32]. 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 behaviors.

Impact on knowledge of HIV/AIDS

Health education through educational games increases knowledge, attitudes, and behavior [25], [27]. 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 be complete. 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 [23] 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 [33], [34], experience, and exposure to information [35]. 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 [36]. 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 and Kusumaningsih [37] 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 [38]. As in his research, Estifanos *et al.* [39] 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 [38]. In this study, health education through the Kasaba card game also considers the memory factor in increasing knowledge. The card game is held 3 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 [40]. Sensory memory records information that enters through the five senses. If the information is responded to, it is

transferred to the short-term memory system. A short-term memory system can store data for 30 s, and a short-term memory system can hold about seven pieces of data at a time [41].

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 15–25 s, and the information will be lost [42]. When data are 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 [40], [42]. Thus, the frequency of the Kasaba Quartet Card game, which is repeated 3 times with a 1-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 [43]. Similarly, Fandakova and Gruber [44] 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 [45], 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 [46], [47]. Likewise, Yu *et al.* [48] 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 [49] 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 [50]. 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.* [51] 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 toward healthy behavior is most likely to carry out healthcare such as exercising and avoiding behaviors detrimental to that person's health [52], [53]. 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.

The results of this study can be used as a policy basis in the design of prevention programs carried out by health practitioners and the government on a broader scope. The prevention program was designed through health education based on simulation games such as the quartet card game, which increased knowledge and self-efficacy in the findings. Based on behavioral health theory, the intervention to reduce HIV risk increases knowledge, awareness, and self-efficacy [54], [55].

Therefore, interventions like this can be a reference in preventing HIV infection in adolescents.

Limitation of study

The limitation of this study relates to the application of a 1-day break time for each quartet card game intervention. This break time was intended to internalize education results to students, but this action can also cause bias. The bias that occurs is that students can forget about the information provided during the intervention, and students can also find out educational information through other sources. The researcher tried to control these confounding factors by emphasizing that each participant did not seek or read news related to HIV/AIDS from other sources.

In addition, the use of purposive sampling to selecting samples can be a limitation in generalizing the results. However, this proportional sampling was conducted to obtain in-depth and specific information on the variables and targets studied. In this study, the quartet card game only involved a particular 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.

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.

Acknowledgment

We express our most profound appreciation to all the respondents involved in this study. Likewise, we

would like to thank all those who have contributed to this research.

References

1. Ministry of Health Republic of Indonesia. Report on the Progress of HIV/AIDS and Sexually Transmitted Infectious Diseases (STIs) Quarter I 2021. Jakarta: Ministry of Health Republic of Indonesia; 2021.
2. Ministry of Health Republic of Indonesia. Report on the Progress of HIV/AIDS and Sexually Transmitted Infectious Diseases (STIs) Quarter IV of 2020. Jakarta: Ministry of Health Republic of Indonesia; 2020.
3. Public Health Offices of Bandung. Number of People Living with HIV/AIDS [Jumlah Penderita HIV/AIDS]. Bandung: Public Health Offices of Bandung; 2018.
4. Public Health Offices of Bandung. Health Profile of Bandung 2020 [Profil Kesehatan Kota Bandung Tahun 2020]. Bandung: Public Health Offices of Bandung; 2020.
5. Pardeck JT, Pardeck JA. Bibliotherapy: A Clinical Approach for Helping Children. England, UK: Taylor & Francis; 2021.
6. Hendra WG, Hayati S, Maidartati M. The effect of health counseling on adolescent knowledge about HIV/AIDS in Bandung regency [Pengaruh penyuluhan kesehatan terhadap pengetahuan remaja tentang HIV/AIDS Di Kabupaten Bandung]. *J Keperawatan BSI*. 2017;5:1-9.
7. Mandiwa C, Namondwe B, Munthali M. Prevalence and correlates of comprehensive HIV/AIDS knowledge among adolescent girls and young women aged 15-24 years in Malawi: Evidence from the 2015-16 Malawi demographic and health survey. *BMC Public Health*. 2021;21(1):1508. <http://doi.org/10.1186/s12889-021-11564-4>
PMid:34348679
8. Edeh NC, Nwaubani OO, Eseadi C, Ogidi CI, Offor CC. Awareness and attitude of senior secondary school students towards HIV/AIDS risk factors and preventive measures in Ebonyi State, Nigeria. *Libr Philos Pract*. 2021;5368:1-23.
9. Schnell K, Ringeisen T, Raufelder D, Rohrmann S. The impact of adolescents' self-efficacy and self-regulated goal attainment processes on school performance-do gender and test anxiety matter? *Learn Individ Differ*. 2015;38:90-8.
10. Talsma K, Schüz B, Schwarzer R, Norris K. I believe, therefore I achieve (and vice versa): A meta-analytic cross-lagged panel analysis of self-efficacy and academic performance. *Learn Individ Differ*. 2018;61:136-50.
11. Kyung KS, Shin S, Lee JI. The moderating effect of self-efficacy on the relationship between internet game addiction and aggression among Korean adolescents. *Soc Sci*. 2021;10:58-66.
12. Peker A, Eroglu Y, Yildiz MN. Does high self-efficacy in adolescents minimize cyber bullying behaviour? *Clin Exp Health Sci*. 2021;11:140-5.
13. Opoku MP, Agyei-Okyere E, Nketsia W, Torgbenu EL, Kumi EO. Perceived self-efficacy of students and its influence on attitudes and knowledge about HIV/AIDS in Ghana. *Int J Health Plann Manage*. 2021;1-15. <http://doi.org/10.1002/hpm.3371>
PMid:34697830
14. Wilandika A, Kamila A, Sofiyah Y. The effect of e-module TRIAD kesehatan reproduksi remaja (KRR) on HIV self-efficacy in preventing HIV vulnerable behaviour. *JTP*. 2021;23:146-52.
15. Hayes C, Eley C, Brown C, Syeda R, Verlander NQ, Hann M, *et al*. Improving educator's knowledge and confidence to teach infection prevention and antimicrobial resistance. *Health Educ*

- J. 2021;80:131-44.
16. Roopa S, Geetha MB, Rani A, Chacko T. What type of lectures students want?-A reaction evaluation of dental students. *J Clin Diagn Res.* 2013;7(10):2244-6. <http://doi.org/10.7860/JCDR/2013/5985.3482>
PMid:24298487
 17. Mustafa T, Farooq Z, Asad Z, Amjad R, Badar I, Chaudhry AM, et al. Lectures in medical education: What students think? *J Ayub Med Coll Abbottabad.* 2014;26(1):21-5.
PMid:25358209
 18. Shanthi TR, Chauhan J, Thiagarajan R. Effectiveness of interactive and traditional training methods. *Indian Res J Ext Educ.* 2016;10:58-65.
 19. Spruijt A, Leppink J, Wolfhagen I, Bok H, Mainhard T, Scherpbier A, et al. Factors influencing seminar learning and academic achievement. *J Vet Med Educ.* 2015;42(12):259-70. <http://doi.org/10.3138/jvme.1114-119R2>
PMid:26075625
 20. Zeng HL, Chen DX, Li Q, Wang XY. Effects of seminar teaching method versus lecture-based learning in medical education: A meta-analysis of randomized controlled trials. *Med Teach.* 2020;42(12):1343-9. <http://doi.org/10.1080/0142159X.2020.1805100>
PMid:32795244
 21. Khosa DK, Volet SE, Bolton JR. An instructional intervention to encourage effective deep collaborative learning in undergraduate veterinary students. *J Vet Med Educ.* 2010;37(4):369-76.
 22. Peng Z, Qian S. Application of seminar teaching method in teaching of laboratory diagnosis for 8-year clinical medicine program. *Northwest Med Educ.* 2011.
 23. Sutriyanto K, Raksanagara AS, Wijaya M. The effect of kasugi card game on increasing knowledge of clean and healthy life behavior in students [Pengaruh permainan kartu kasugi terhadap peningkatan pengetahuan perilaku hidup bersih dan sehat pada siswa]. *J Sist Kesehatan.* 2016;1(4):193-200. <http://doi.org/10.24198/Jsk.V1i4.12828>
 24. Indah AP, Gamayanti IL. The effectiveness of preventing video game addiction using ludo games for elementary school students [Efektivitas pencegahan adiksi video game menggunakan ludo game untuk siswa sekolah dasar]. *Ber Kedokt Masy.* 2016;32(9):317-22. <https://doi.org/10.22146/bkm.8462>
 25. Laila N, Tulloh RR, Iswati N. Quartet card games to improve knowledge, behavior and attitude of children about dental and oral health. *J Keperawatan Soedirman.* 2018;13(1):44-9.
 26. Ayriza Y, Setiawati FA, Triyanto A, Gunawan NE, Anwar MK, Budiarti ND, et al. The effectiveness of quartet card game in increasing career knowledge in lower grade elementary school students. *Curr Psychol.* 2021:1-12.
 27. Lestari O, Priscylio G, Copriady J, Holiwarni B. The use of quartet card game on hydrocarbon to improve learning outcomes ten-grade students. *J Phys Conf Ser.* 2020;1567:32096.
 28. Hakim L, Subroto WT, Kurniawan RY. Developing an quartet card game as an evaluation of economics learning for senior high school. *Int J Control Theory Appl.* 2015;8(4):1645-65.
 29. Gruescu S, Thomas NP. *The Economists' Quartet-A Game, Not a Theory;* 2002.
 30. Wilandika A. Factor analysis of the instrument of self-efficacy prevention of HIV-risk behavior [Analisis faktor instrumen efikasi diri pencegahan perilaku berisiko HIV]. *J Holist Nurs Sci.* 2017;4:25-33.
 31. Jost P, Künz A. Cards and roles: Co-designing privacy serious games with an online role-playing boardgame. In: *International Conference Games and Learning Alliance.* Berlin, Germany: Springer; 2021. p. 187-97.
 32. Kordaki M, Gousiou A. Digital card games in education: A ten year systematic review. *Comput Educ.* 2017;109:122-61. <http://doi.org/10.1016/j.compedu.2017.02.011>
 33. Kene C, Deribe L, Adugna H, Tekalegn Y, Seyoum K, Geta G. HIV/AIDS related knowledge of university students in Southeast Ethiopia: A cross-sectional survey. *HIV AIDS (Auckl).* 2021;13:681-90. <http://doi.org/10.2147/HIV.S300859>
PMid:34168506
 34. Demissie GD, Muchie KF, Teshome DF, Sisay MM. Determinants of comprehensive knowledge of HIV/AIDS among females aged 15-24 years in Ethiopia. *Ethiop J Health Biomed Sci.* 2019;9:29-36.
 35. Katushabe D. Assessments of Factors Associated with Comprehensive Knowledge about HIV Prevention among Young People (15-24 Years), Data: UDHS 2016; 2021.
 36. Murwira TS, Khoza LB, Mabunda JT, Maputle SM, Mpeti M, Nunu WN. Knowledge of students regarding HIV/AIDS at a rural university in South Africa. *Open AIDS J.* 2021;15:42-51.
 37. Rilyani R, Kusumaningsih D. Factors associated with HIV/AIDS prevention behavior in adolescents at persada senior high school bandar lampung in 2015 [Faktor-faktor yang berhubungan dengan perilaku pencegahan HIV/AIDS pada remaja di SMA persada bandar lampung tahun 2015]. *Holistik J Kesehatan.* 2016;10:221-7.
 38. Suhardi S. *Treatise on the Philosophy of Science [Risalah Filsafat Ilmu].* Medan: CV. Pusdikra Mitra Jaya; 2021.
 39. Estifanos TM, Hui C, Tesfai AW, Teklu ME, Ghebrehiwet MA, Embaye KS, et al. Predictors of HIV/AIDS comprehensive knowledge and acceptance attitude towards people living with HIV/AIDS among unmarried young females in Uganda: A cross-sectional study. *BMC Womens Health.* 2021;21:1-13.
 40. Roediger HL, Dudai Y, Fitzpatrick SM. *Science of Memory: Concepts.* Oxford: Oxford University Press; 2007.
 41. Bhinnety M. Memory structure and processes [Struktur dan proses memori]. *Bul Psikol.* 2008;16(2):74-88.
 42. Vianus A. *The Living Word in You: Membangun Kehidupan Dalam Firman: Sebuah Cara Hidup Yang Mengagumkan,* PBMR ANDI; 2021.
 43. Asfar A, Asnanar WO. The effect of health education on the level of knowledge and attitudes about HIV/AIDS in Baznas Middle School, South Sulawesi province [Pengaruh penyuluhan kesehatan terhadap tingkat pengetahuan dan sikap tentang penyakit HIV/AIDS di SMP Baznas provinsi sulawesi selatan]. *J Islam Nurs.* 2018;3(1):26-31. <https://doi.org/10.24252/join.v3i1.5471>
 44. Fandakova Y, Gruber MJ. States of curiosity and interest enhance memory differently in adolescents and in children. *Dev Sci.* 2021;24(1):e13005. <http://doi.org/10.1111/desc.13005>
PMid:32524703
 45. Wilandika A. Effect of case-based learning on knowledge of HIV/AIDS, stigma and acceptance of nursing students in PLWHA [Pengaruh case-based learning terhadap pengetahuan HIV/AIDS, stigma dan penerimaan mahasiswa keperawatan pada ODHA]. *J Pendidik Keperawatan Indones.* 2017;3:1-12.
 46. Rodríguez V, Lagunas FL, Acosta C, Miner S, Campos L, Peragallo N. Knowledge and self efficacy related with HIV prevention among Chilean women. *Invest Educ Enferm.* 2011;29(2):222-9.
 47. Mahat G, Scoloveno MA. HIV peer education: Relationships between adolescents' HIV/AIDS knowledge and self-efficacy. *J HIV AIDS Soc Serv.* 2010;9(4):371-84. <https://doi.org/10.1080/15381501.2010.525479>
 48. Yu B, Wang Y, Chen X. Perception of peer condom use buffers the associations between HIV knowledge, self-efficacy, and condom-use intention among adolescents: A moderated mediation model. *Prev Sci.* 2021;1-10. <http://doi.org/10.1007/s11121-021-01324-6>

- PMid:34962622
49. Bandura A. *Regulative Function of Perceived Self-Efficacy*. United Kingdom: Psychology Press; 2013. p. 279-90.
50. Urdan T, Pajares F. *Self-Efficacy Beliefs of Adolescents*. United Kingdom: IAP; 2006.
51. Newby K, Teah G, Cooke R, Li X, Brown K, Salisbury-Finch B, *et al*. Do automated digital health behaviour change interventions have a positive effect on self-efficacy? A systematic review and meta-analysis. *Health Psychol Rev*. 2021;15(1):140-58. <http://doi.org/10.1080/17437199.2019.1705873>
PMid:31847702
52. Parkinson J, David P, Rundle-Thiele S. Self-efficacy or perceived behavioural control: Which influences consumers' physical activity and healthful eating behaviour maintenance? *J Consum Behav*. 2017;16:413-23.
53. Masoompour M, Tirgari B, Ghazanfari Z. The relationship between health literacy, self-efficacy, and self-care behaviors in diabetic patients. *Evid Based Care*. 2017;7:17-25.
54. Marsiglia FF, Jacobs BL, Nieri T, Smith SJ, Salamone D, Booth J. Effects of an undergraduate HIV/AIDS course on students' HIV risk. *J HIV AIDS Soc Serv*. 2013;12(2):172-89. <http://doi.org/10.1080/15381501.2013.790750>
PMid:24058288
55. McCarthy M. HIV prevention efforts reach fewer than one in five at risk. *Lancet*. 2003;361(9370):1711.