ORIGINAL ARTICLES

UDC: 355/359:616-036.22]:: [37::616.9-084
DOI: 10.2298/VSP140226042J

The impact of an educational film on promoting knowledge and attitudes toward HIV in soldiers of the Serbian Armed Forces

Značaj obrazovnog filma za unapređenje znanja i stavova prema HIV infekciji pripadnika Vojske Srbije

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Abstract

Background/Aim. Millions of soldiers around the world represent one of the most vulnerable populations regarding exposure to human immunodeficiency virus (HIV) infection. The programs for HIV prevention remain the most viable approach to reducing the spread of HIV infection. Very few studies have tested the effectiveness of HIV preventive interventions undertaken in military population. The aim of this study was to determine the effectiveness of educational film to transfer knowledge about HIV infection to soldiers. **Methods.** We performed a quasi-experimental study among 102 soldiers of the Serbian Armed Forces. The experimental intervention consisted of the HIV knowledge pre-questionnaire, watching a film on HIV knowledge, then the post-HIV knowledge questionnaire. The results of pre-and post-HIV knowledge questionnaires were compared. **Results.** There were 23 questions in the test. The average total score on the questionnaire before watching the film was 18.23 and after watching it was 20.14, which was statistically significant difference ($p < 0.001$). **Conclusions.** The results of the study show that viewing a film on HIV infection is an effective method of transferring knowledge about HIV to the Serbian military population.

Key words:
military personnel; hiv infections; education; motion pictures as topic.

Apstrakt

Uvod/Cilj. Milioni vojnika širom sveta predstavljaju jednu od najrizičnijih populacija za sticanje infekcije prouzrokovane virusom humane imunodeficijencije (HIV). Preventivni programi ostaju i dalje najbolji pristup u suzbijanju pandemije HIV. U malom broju studija proveravana je efektivnost intervencija preduzetih radi prevencije infekcije HIV u vojnoj populaciji. Cilj ove studije bio je da se utvrdi efektivnost obrazovnog filma u procesu prenošenja znanja o epidemiologiji HIV infekcija vojnicima. **Metode.** Izvedena je kvazieksperimentalna studija sa 102 ispitanika, pripadnika Vojske Srbije. Eksperimentalna intervencija se sastojala u gledanju obrazovnog filma o HIV infekciji i od popunjavanja upitnika znanja o HIV infekciji pre i posle gledanja filma. Poređeni su rezultati postignuti na ova dva testa. **Rezultati.** Upitnik se sastojao iz 23 pitanja, a svaki tačan odgovor bodovan je jednim bodom. Prosečan skor na upitniku popunjavanom pre gledanja filma bio je 18,23, a na onom posle gledanja filma 20,14, što je bila statistički značajna razlika ($p < 0,001$). **Zaključak.** Rezultati studije pokazali su da je gledanje obrazovnog filma o HIV infekciji efektivna metoda prenosa znanja pripadnicima Vojske Srbije.

Ključne reči:
kadar, vojni; infekcija, hiv; obrazovanje; filmovi, tematski.

Introduction

It has been more than 30 years since the spread of human immunodeficiency virus (HIV) among humans began [1]. In the last three decades, through the professional and popular literature that has been available to everyone, both professionals and others, it has been possible to learn about epidemiology and prevention of HIV transmission, as well as about the pathology, clinical manifestations and treatment of acquired immunodeficiency syndrome (AIDS), the disease caused by this virus. However, despite the fact that HIV transmission could be successfully prevented, every year millions of people are infected

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with the virus [2]. Therefore, prevention programs remain one of the most viable approaches to reducing the transmission of HIV. Many authors have argued that preventive interventions need to be developed and implemented in a manner that is population-specific for the persons being targeted [3–6].

Health education is an important activity for controlling infectious diseases including HIV [7, 8]. Its objectives are: to give information and provide knowledge and understanding of health issues, to ensure that well-informed decisions are made and to change people's individual attitudes and behavior so that they adopt a healthy lifestyle. Health education methodologies are grouped into lectures including discussion points, individual (interview and guidance) consulting, and a combination of the two, using teaching aids such as: words, writings, posters, brochures and visual media techniques such as radio, TV and film. Using film as a teaching aid has many advantages regarding reliability in describing the action, holding one's attention and displaying certain topics in quite an extraordinary and comprehensible way. The disadvantage is the financial aspect, in particular its high production costs and special requirements necessary for its presentation (requires special technical support and cinema).

More than 22 million soldiers around the world represent one of the most vulnerable populations to contracting and transmitting HIV [9, 10]. Very few studies have tested the effectiveness of preventive interventions undertaken in military population [11]. The aim of this study was to determine the effectiveness of an educational film which was presented to soldiers of the Serbian Armed Forces (SAF) in order to evaluate their knowledge of HIV and plan appropriate future primary prevention interventions in military environment.

Methods

A quasi-experimental study was designed and performed in January 2010. The study participants were soldiers that were conveniently selected for participation during their regular military service in SAF. The design consisted of three parts: the participants completed HIV knowledge questionnaires, then they watched the educational film on HIV transmission/progression/disease and lastly, they completed the same questionnaires again. All the three activities were completed in the same day.

The educational film "HIV/AIDS Prevention and Control in the SAF" was produced by the Military Medical Academy (MMA) in Belgrade, Serbia, thanks to the funds raised through mutual effort of Serbia and the USA which collaborated on the Department of Defense HIV/AIDS Prevention Program (DHAPP). The content of the film was designed by the SAF to specifically address to the military population. The film lasts for approximately 17 minutes and clearly answers a number of important questions about HIV transmission, voluntary counseling and testing, and destigmatization of people living with HIV (PLHIV).

The HIV knowledge questionnaire consisted of 23 multiple choice questions (maximum total score was 23). Each question has a single correct answer. All the questions in the questionnaire can be divided into three groups, according to the three types of information given in the film: questions related to the risk of HIV transmission are from 1 to 11, questions 12–17 associated with voluntary testing and counseling and 18–23 about stigma and discrimination of people living with HIV. In addition, there were a few demographic questions.

The statistical package SPSS for Windows (ver. 16) was used for the statistical analysis. To test the significance of differences, *t*-test was used for parametric and χ^2-test for nonparametric categories. A statistical significance was accepted at the level of $p < 0.05$.

The investigation was approved by the Scientific Research Ethics Committee of Military Medical Academy (MMA).

Results

A total number of study participants that were recruited during their regular military service was 102. All of them were soldiers and male. Most of them (about 90%) were under the age of 25. The majority of the participants (about 76%) had high school education and were in a relationship (about 70%) (Table 1).

Comparing data collected before and after watching the film, the minimum score in the questionnaire was 8 and maximum 23. Three participants answered all the questions correctly

Table 1

Demographic data

Parameters	n (%)
Age (years)	
15–24	92 (89.32)
25–35	10 (10.68)
Education	
elementary	1 (0.97)
high school	78 (76.70)
college	12 (11.65)
faculty	11 (10.68)
Marital status	
married	1 (0.97)
in relationship	72 (69.91)
divorced	1 (0.97)
single	28 (28.15)
Total	102 (100)

before watching the film and nine participants answered all the questions correctly after watching film (Table 2).

The average total score in the questionnaire before watching the film was 18.23 and after watching it 20.14, which was statistically significant difference ($p < 0.001$) (Table 3).

ing 10 questions, there was an increase in the number of correct answers which was not statistically significant.

On the other hand, after viewing the film the number of correct answers decreased for 4 questions (1, 7, 12 and 15). For the question 15 this difference was statistically significant (Table 5).

Table 2

Score in the HIV knowledge questionnaire before and after watching the film

Score	Before watching film		After watching film	
	n (%)	Cumulative %	n (%)	Cumulative %
8.00	/	/	1 (1.0)	1.0
10.00	1 (1.0)	1.0	/	/
11.00	2 (2.0)	2.9	1 (1.0)	1.9
12.00	2 (2.0)	4.9	/	/
13.00	5 (4.9)	9.8	1 (1.0)	29
14.00	/	/	2 (1.9)	4.9
15.00	2 (2.0)	11.8	/	/
16.00	9 (8.8)	20.6	2 (1.9)	6.8
17.00	14 (13.7)	34.3	4 (3.9)	10.7
18.00	15 (14.7)	49.0	4 (3.9)	14.6
19.00	19 (18.6)	67.6	11 (10.7)	25.2
20.00	9 (8.8)	76.5	23 (22.3)	47.6
21.00	15 (14.7)	91.2	23 (23.3)	70.9
22.00	6 (5.9)	97.1	21 (20.4)	91.3
23.00	3 (2.9)	100.0	9 (8.7)	100.0
Total	102 (100.0)	/	102 (100.0)	/

HIV – human immunodeficiency virus.

Table 3

Average score of HIV knowledge questionnaire for the soldiers before and after watching the film

Testing	X	SD	t	*p*
Before film	18.24	2.78	4.99	0.001
After film	20.14	2.48		

HIV – human immunodeficiency virus.

Table 4

Average scores of HIV knowledge questionnaire for a different group of soldiers before and after the film

Characteristics of soldiers	Number	Average score before the film	Average score after the film	Average score difference
Age (years)				
15–25	92	18.26	20.05	1.79
25–35	10	20	21.55	1.55
Education				
elementary	1	13	14	1
high	78	18	20.2532	2.2532
college	12	19.17	19.67	0.5
faculty	11	19.36	21.09	1.73
Marital status				
married	1	17	20	3
divorced	1	13	17	4
relationship	72	18.6389	20.21	1.57
single	28	18.1429	20.36	2.21

HIV – human immunodeficiency virus.

The greatest transfer of HIV knowledge was noticed in the soldiers over the age of 25, with high school education and those who were in a relationship (Table 4).

There was a total number of 23 questions in the questionnaire and for 19 of them, there was an increase in knowledge (2–6, 8–11, 13–14, and 16–23) after watching the film. The difference in the number of correct responses was statistically significant for 9 questions (2–5, 17–20 and 23), while for the remain-

Discussion

Some studies suggest that HIV in soldiers detrimentally affects military readiness and national and regional security [12, 13]. Providing soldiers with basic HIV education enables them to protect themselves from becoming infected. A study in the Ethiopian army showed that military personnel who had inaccurate knowledge about HIV transmission and

Table 5

Human immunodeficiency virus (HIV) knowledge questionnaire, correct answers before and after watching the film

No	Question	Before film n (%)	After film n (%)	χ^2-test	*p*
1	Can only one sexual intercourse transfer HIV?	97 (95.1)	95 (92.2)	0,30	0.57
2	Is HIV transmission possible from the mother to the child during pregnancy, delivery and breastfeeding?	54 (52.9)	93 (90.3)	33.42	0.001
3	Is it possible that any of your sexual partners is HIV infected and that he/she does not know that?	90 (88.2)	103 (100)	10.82	0.001
4	Can HIV infection be transmitted through oral sex?	42 (41.2)	63 (61.2)	7.41	0.006
5	Can HIV infection be transmitted using a common accessory for personal hygiene (razors)?	77 (75.5)	91 (88.3)	4.89	0.027
6	What you should avoid if you want to reduce the risk of getting HIV infection through sex?	91 (89.2)	99 (96.1)	2.65	0.103
7	Are those who frequently change sexual partners and don't use a condom in high risk for HIV infection?	102 (100)	100 (97.1)	1.33	0.24
8	Can anyone become infected with HIV if behaves risky?	87 (85.3)	92 (89.3)	0.43	0.51
9	Can HIV be transmitted during sex with a HIV-positive person?	100 (98.0)	102 (99.0)	0.0	0.99
10	Can HIV be transmitted if body fluids of infected person come into contact with broken skin or mucous membranes of sensitive individuals?	74 (72.5)	84 (81.6)	1.87	0.172
11	Is HIV infection possible after receiving organ transplants from a HIV-positive person?	92 (90.2)	88 (85.4)	0.68	0.40
12	After infection, how long someone carries HIV?	92 (90.2)	89 (86.4)	0.39	0.53
13	Is prevention the only salvation from this incurable disease?	90 (88.2)	99 (96.1)	3.39	0.065
14	Should all persons who behave risky be tested on HIV?	97 (95.1)	102 (99.0)	1.57	0.209
15	Does HIV-positive person show symptoms of the disease from which we can distinguish him/her by healthy persons?	66 (64.7)	45 (43.7)	8.29	0.004
16	Are there people in our country suffering from HIV?	96 (94.1)	98 (95.1)	0.0	0.98
17	How long after HIV infection routine tests can prove it?	47 (46.1)	76 (73.8)	15.26	0.001
18	Can HIV infection be spread in swimming pools?	71 (69.6)	97 (94.2)	19.28	0.001
19	Can HIV infection be transmitted through food prepared by an infected person?	80 (78.4)	97 (94.2)	9.47	0.002
20	Can HIV infection be transmitted through a mosquito bite that has previously bitten an infected person?	52 (51)	96 (93.2)	43.43	0.001
21	Can HIV infection be transmitted through shaking hands, hugging and kissing?	91 (89.2)	99 (96.1)	2.65	0.103
22	Can someone get HIV infection if he/she is in the same room with an infected person?	87 (85.3)	96 (93.2)	2.57	0.109
23	Can HIV Infection be obtained from the use of public toilets?	83 (81.4)	99 (96.1)	9.75	0.002

prevention were in more than 3 times higher risk of engaging in sexual risk behaviors compared with the personnel with accurate knowledge [14]. Acquiring knowledge and skills encouraged them to avoid or reduce behaviors that involve the risk of HIV infection and stimulated them to take voluntary counseling and testing. Angolan soldiers who received HIV prevention training have reported an increased condom use and less unprotected vaginal sex in the 3 previous months, a reduced number of partners as well as a greater HIV-related knowledge in 3 and 6 months [15]. Furthermore, 74% of surveyed German soldiers considered HIV education necessary and 83.2% would like to accept relevant testing [16]. HIV education also helps reduce stigma and discrimination before they have an opportunity to grow, by dispelling false information that can lead to the sense of fear and guilt. This is crucial for prevention as stigma often makes people reluctant to be tested for HIV. A person who is not aware of being HIV infected is more likely to pass the virus on to others [17].

In our investigation, we chose to use a film as a teaching aid in health education with the aim of transferring knowledge. In our population, young people consider film more interesting and films get more of their attention than the traditional lecture format. Some other investigations in different armies, as we will discuss, also came to similar conclusions. For example, the servicemen in China and Turkey mainly gain their knowledge about HIV through different kinds of media such as newspapers, magazines and extracurricular books [18, 19]. An investigation carried out in 1996 by the Institute of Microbiology and Epidemiology of the Academy of Military Medical Sciences, Beijing also indicated that comprehensive and proper publicity and education could play an active role in the prevention of HIV infection [18].

This study was designed to determine the effectiveness of educational film, but also to assess the knowledge of HIV in military personnel in order to plan appropriate future primary prevention interventions. The research on voluntary blood donors from the SAF showed that the most frequent risky sexual behavior in this study group was inconsistent condom use and sexual contact with partners who had engaged in high risk sexual activities [20]. As a re-

sult of this study, we tried to find out if the lack of HIV knowledge is one of the reasons for such risky behavior.

The average score in the HIV knowledge questionnaire was about 18 out of 23 points for all the participants before watching the film, that the majority of soldiers had already had what we believe to be sufficient knowledge about HIV infection. Still, some of our participants answered to almost half of HIV-related questions incorrectly. Depending on age, education and marital status of participants, the greatest transfer of knowledge was noticed among single soldiers with high school education and above the age of 25. A larger transfer of knowledge was expected among older soldiers, as well as among single ones. Based on our previous study in the SAF (unpublished data), it appears that single military personnel have more sexual partners than those who are married. As a result, they may be more likely to use condoms and are aware of the transmission of HIV infection. Also, as it was expected, participants with the highest level of education (University) had the highest average score in the questionnaire before watching the film (19.36). Soldiers with high school education had the lowest score on the pre-film questionnaire (18.0), but considering their education level, they managed to enhance their knowledge by watching the film and increased their average total score to about 20. The number of soldiers with elementary school education and soldiers who were married or divorced was too small for reliable conclusions about the transfer of knowledge in those groups.

The soldiers in our study showed a good level of knowledge. In total, more than 80% of the questions were answered correctly by about 65% of soldiers before watching the film and about 90% after the film. Nevertheless, only 9 (8.7%) soldiers answered all the questions correctly after watching the film. The results of our are similar to the results of studies performed in the South African National Defense Force on a group of military recruits (aged 18 to 24) who appropriately responded in more than 80% of the cases [21]. In addition to this, 8.5% of servicemen in China answered all the questions listed in the questionnaire correctly [18].

The lack of knowledge showed by our participants could be explained by misconceptions and myths about HIV prevention and transmission which are widespread, especially among low-income heterosexuals [22]. In our participants, we found two opposite poles of knowledge regarding HIV infections. Some soldiers have excessive fear of HIV infection (for example, they think that just being in the same room with someone who is HIV infected is risky). On the other hand, there are soldiers who do not fear of HIV infection at all. They simply ignore and misunderstand scientific knowledge regarding HIV infections and most of them think that HIV infection is reserved only for homosexuals and prostitutes. The latter are similar to servicemen in China, the majority of whom thought they had very little, or no chance to contract the illness [18]. Furthermore, a survey of the knowledge of HIV infection in recruits in the German military showed that 4% of German Army considered their own knowledge of HIV very good and 7% considered it insufficient [16].

Although the overall average HIV knowledge score in our study was high (18 out of 23 points), 58.8% of respondents believed that HIV could not be transmitted by oral sex. This was the most widespread misconception among the participants, which is consistent with the investigation among blood donors in the SAF where more than half of them reported unprotected oral sex [20].

The educational film helped in education and elimination of several misconceptions. Firstly, in the group of questions about the risk of HIV transmission, transfer of knowledge occurred for 8 questions and it was significant for 4 of them. A large number of participants learned from the film that HIV infection could be transmitted from the infected mother to the child during pregnancy, childbirth and breastfeeding (52.9 *vs* 90.3%), that there was a possibility that any of their sexual partners could be HIV positive (88.2 *vs* 100%), that HIV infection could be transmitted through oral sex (41.2 *vs* 61.2%), as well as by using a common accessory for personal hygiene such as razors (75.5 *vs* 88.3%). Few of them (85.3 *vs* 89.3%) also learned that anyone could become HIV infected if she/he behaved in a risky maner and that most important risky behaviors are the frequent change of sexual partners, sex with unknown people and the inconsistent use of condoms (89.2 *vs* 96.1%). All of this is very important from the perspective of the results of the investigation on blood donors from the SAF which showed that only 29.7% of them always use condoms, while about 17% never or almost never use condoms [20].

A lower number of correct answers after watching the film occurred for 3 questions, but it was significant for none of them. The largest increase of wrong answers occurred for the question about the risk after organ transplantation (14.6 *vs* 9.8%). Since we gave information about mandatory HIV testing for all blood, cell, tissue and organ donors, we assume that some of the participants understood no more risk for transplant procedures. Secondly, in the group of questions about voluntary testing and counseling, the knowledge increased in 4 of the 6 questions, there was a significant result of the question about routine tests for HIV: more than half of the participants thought that it was possible to test HIV-positive on the same day or a day after the exposure occurred. After watching the film, about 75% of soldiers learned that it was more likely that someone would test HIV-positive 2–6 weeks after the exposure.

For the other three questions from this group, the increase in knowledge was present but not significant. On the other hand, there were two questions that the participants answered incorrectly after viewing the film, one of which (about the symptoms of HIV infection) was significant. The number of soldiers who knew that a HIV positive person usually did not show any symptoms of disease dropped from 65% to 44% of the participants. However, this result should be put into perspective because after the film some of the participants might have confused HIV with AIDS. Further investigation of the film itself should be evaluated for accuracy and possible participant confusion.

Finally, the largest transfer of knowledge was in the group of questions related to the stigmatization of PLHIV. This group consisted of six questions, four of which showed a significant increase of knowledge. For example, the number of soldiers who thought that HIV infection could be

transmitted through a mosquito bite dropped from 49% to less than 7%. A significant increase in knowledge was also seen for other three questions. The greatest increase of knowledge was for the number of soldiers who had believed that HIV infection could be spread in a swimming pool (it dropped from 30.4 to 5.8%). The transfer of knowledge occurred but was not significant for other two questions from this group.

We believe that elimination of the prejudice toward HIV transmission is very important. Prejudice leads to fear, which again leads to stigmatization and more importantly, to discrimination of PLHIV. For example, investigation on recruits of the German Army shows that 25% of soldiers think that each HIV-infected soldier should be discharged from military service and almost 20% think that the entire barracks should be informed of such a case. Totally 36% of soldiers were in favor of obligatory registration of all HIV infected by name and more than half of them also supported a continued observation of the person infected with HIV [16].

Our study has two limitations. Firstly, findings may not be generalized to all military personnel in the SAF since the sample was selected only from soldiers. Secondly, although women are increasingly involved in the SAF, we were not able to make a meaningful gender comparison because we did not have any female participants in this study. Future studies on risky behaviors in the military environment should also include female military personnel, in order to determine their knowledge and the extent to which females in the Serbian Armed Forces are vulnerable to HIV infection. In addition, a 6-month follow-up of the same participants, with the same questionnaire would also strengthen the study and show if long-term transfer of knowledge occurred and would be considered for future studies.

Conclusion

The growing epidemic of HIV requires targeted interventions in populations which are at risk of infection. This study confirms that many soldiers lack the knowledge and have some misconceptions about human immunodeficiency virus infection and that there is room to increase the knowledge about HIV prevention, transmission, and voluntary counseling and testing in order to decrease risky sexual behaviors.

The results of the study show that the film effectively transferred the knowledge about HIV to the military population. Most of the study participants gained knowledge from watching this educational film. The soldiers learned about different aspects of HIV, but the best results were achieved in elimination of misconceptions that may lead to stigma and discrimination of people living with HIV. Watching films is good for transferring knowledge among many levels of military personnel, especially in the groups of single, high school educated persons above the age of 25.

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Received on February 26, 2014.
Accepted on April 23, 2014.
Online First June, 2015.