

# Evaluation of Drug Abuse Prevention Program by Utilizing of CD-ROM Material

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We evaluated a health instruction program for drug abuse prevention that utilized CD-ROM material. The purpose of this study was to accumulate useful data to contribute to the spread of drug abuse prevention education and multimedia education. Subjects in this study were 408 junior high school 2nd grade students (consisting of 203 males and 205 females). This program was undertaken once in February 2000 and again in November 2000. Two health and physical education teachers working in the subject school cooperatively taught the lesson (Team Teaching). Student operated individual PCs, one per student, and studied all contents of the CD-ROM material. Two lessons were done in each case. We conducted surveys 1 week before, 1 week after, and 1 month after the instructions to evaluate for educational effect. This investigation was composed of 14 items concerning knowledge of drug abuse prevention, 9 items concerning awareness of and attitude toward drug abuse, 4 items concerning the CD-ROM material, and space for free description. We have proved in previous research that the educational effect was excellent regarding knowledge. In this paper, we report on the educational effect regarding awareness and attitude for drug abuse. The results are as follows: · The ratio of groups with 'permissible' attitudes toward drug abuse decreased. The ratio of those with 'non-permissible' attitudes increased. · In all of the 9 items concerning awareness of drug abuse, feelings of precaution and resistance increased. · Drug refusal attitudes and skills were clearly promoted. Therefore, It was proven that health instruction utilizing this CD-ROM material brought many excellent results.

**Keywords:** educational effects, CD-ROM, health instruction, junior high school

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## 1. Purpose and Significance

The KÖLN Charter (1999) mentions that the conventional basic learning skills of the 3Rs (*reading, writing and arithmetic*) have recently been augmented by *information and communication technology* (ICT). Information education in school education is becoming more important every year. This has been acknowledged by many public educational institutes.

The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) explains in its National course of study that 'for class subjects, students (children) are entitled to receive fulfilling activities by positively utilizing means of information

such as computer and information communication network' (The Ministry of Education, Science, Sports and Culture, 1998a; 1998b; 1999). In addition, millenium projects are in progress to promote ICT in school settings. With the rapid advancement of incorporating computers into schools, materials and methodology utilizing them must be promptly developed to enhance the content of information education. The content must also be evaluated (Koiso, T, et al., 1999; Koiso, T, et al., 2002; Kokudo, S, et al., 1999).

Health education at school is proactively attempting to employ ICT as a new means of methodology. But another issue concerning educational content is to focus on drug abuse

prevention as a modern educational issue. In recent years, drug abuse is so prevalent among young people that prevention education is an issue urgently needed in nations worldwide (Clayton, R, et al., 1996; Dent, C, et al., 2001; Flewelling, R, et al., 1994; Ishikawa, T., 2001; Katsuno, S., 2001; LoSciuto, L. and Ausetts, M., 1988). Primary prevention in drug abuse prevention emphasizes the importance of preventing people from being given a trigger to use drugs. In this regard, school education is earnestly desired because of its great effects in teaching a lot of children/students at a time (Ichimura, K, et al., 2001; Wada, K., 2001). In the United States, where drug abuse is serious, many education programs have been implemented to prevent drug abuse. One report says that knowledge education and affective education increase knowledge about negative aspects of drug abuse and sometimes affect attitude formation (Botvin GJ, et al., 1992). However, they hardly affect behavior. In the meantime, approaches based on behavioral science are effective. One such approach is the social influence approach. It aims to enhance student skills in confronting the social influence of drug abuse. Another is the life skill training program (Division of Mental Health of World Health Organization, 1994). It teaches personal/social skills such as problem-solving, decision making, and communicative skills, and is useful for drug abuse prevention education (National Institute of Drug Abuse, 2003).

The purpose of this study is to determine the educational effect of utilizing multimedia (CD-ROM) material, which content includes drug abuse prevention for health lesson at junior high school. The multimedia (CD-ROM) material used in the study contains ample educational content of knowledge and life skills and is applicable to examinations in a versatile manner. We have previously reported an examination of the educational effects of knowledge on drugs and drug abuse which found that 1) correct answers improved with good knowledge acquisition and fixation; 2) the score of correction for guessing improved with good secure knowledge acquisition and acquirement; 3) all twelve question items relating to the knowledge received a better corrective response rate; and 4) students evaluated the material favorably (positively) (Koiso, T, et al., 2003). The present study investigates the educational effect of awareness and attitude, using CD-ROM materials about drugs.

## 2. Method

### 2.1. Subjects

Survey subjects were 204 second-year students (102 males, 102 females) in February 2000 and 204 second-year students (101 males, 103 females) in November 2000 with a total of 408 students (203males, 205females) in five classes at a coeducational junior high school affiliated with T University in Metropolitan Tokyo. Two health and physical education teachers (team teaching) taught the lesson.

### 2.2. CD-ROM Material

The CD-ROM material used in the present study was prepared after many researchers had examined drug abuse prevention education for several years as part of base research through the science and research funds sponsored by MEXT (Takaishi, M. and Ishikawa, T., 2000). It has been widely distributed and purchased in the market. The material, thus, is the most appropriate for the purpose of the present study because it has been publicly acknowledged. The material offers easily accessible content for everyone. Students can learn the material voluntarily and interactively, which is characteristic of multimedia materials. In addition to mere knowledge, it offers sound knowledge about drug abuse prevention, teaching life skills to make the best application of obtained knowledge to real life.

Lessons utilizing CD-ROM materials can easily be reproduced. Accordingly, if materials are proven to be worthwhile in actual teaching, they can contribute to the practice of drug abuse prevention education and diffusion of multimedia education. The materials are expected to enhance lesson management and methodology at school.

The CD-ROM material we used comprises three sections: *knowledge*, *skill*, and *self esteem*. The content is shown in **Table 1**.

### 2.3. Procedure of Research on the Lessons

#### 2.3.1. Framework of the Experiment

The lesson and survey were conducted in the following procedure. The lessons (50 minutes × 2) took place in February of 2000 and November of 2000. A pre-test was conducted one week before the

**Table 1** Content of the CD-ROM Material

Sub-menu A: True identity of drugs –Why drug abuse is dangerous?–
<ul style="list-style-type: none"> <li>1) Basic knowledge about drugs <ul style="list-style-type: none"> <li>Danger of drugs</li> </ul> </li> <li>2) Influence of drugs on health <ul style="list-style-type: none"> <li>Serious damage to the cerebrum</li> <li>Junior and senior high school students under growth suffer more serious damage</li> </ul> </li> <li>3) Holding drugs or using drugs only once is a crime.</li> <li>4) Problems of drug abusers <ul style="list-style-type: none"> <li>Addiction</li> <li>Mental and physical damage</li> <li>Aftereffects</li> <li>Crime</li> </ul> </li> </ul>
Submenu B: Temptation of drugs –Is it a true story? –
<ul style="list-style-type: none"> <li>1) Temptation of drug abuse is on your side irrelevant of your will. <ul style="list-style-type: none"> <li>Use drugs unaware that they are drugs</li> <li>Use them by explaining the efficacy (especially diet) of general drugs (in disguise)</li> <li>Use them by having your mental instability (daily frustration) taken advantage of</li> <li>Use them by taking up brags of their experiences</li> </ul> </li> <li>2) To refuse seduction to drugs <ul style="list-style-type: none"> <li>Learn how to express your will</li> <li>Enhancement of communicative skill</li> <li>Simulated experiences</li> </ul> </li> </ul>
Sub-menu C: Are you really sure?–Self-diagnosis–
<ul style="list-style-type: none"> <li>1) To heighten self-esteem <ul style="list-style-type: none"> <li>Observe yourself calmly to learn objective view</li> </ul> </li> <li>2) Various aspects for self analysis by heightening self-esteem <ul style="list-style-type: none"> <li>Meaning of self-esteem</li> <li>Challenging spirit</li> <li>Human relations</li> <li>Achievement of objectives</li> <li>Flexibility</li> <li>Setting a target</li> <li>Accepting yourself</li> <li>Sense of accomplishment</li> </ul> </li> <li>3) Dealing with stress <ul style="list-style-type: none"> <li>Cause of stress</li> <li>Change by stress</li> <li>How to deal with your stress</li> </ul> </li> <li>4) Mass media <ul style="list-style-type: none"> <li>Analysis of publicity</li> <li>Not to be taken in by images</li> </ul> </li> </ul>

Title is 『 WE SAY NO! -Drug Abuse Resistance [knowledge and behavior] -』.

first lesson. The second lesson took place the week following the first lesson. A post-test was conducted the week following the second lesson. A follow-up test was conducted three weeks after the post-test.

### 2.3.2. Procedure of the Lesson

The course taught health as part of the health and physical education curriculum. The two fifty-minute lessons consisted of first: knowledge, and second: skills and self-esteem. Almost all the students finished the entire learning content. The lesson was managed in the following method:

Location: Computer room. Each student used a personal computer (PC), headphones and the

CD-ROM material (stand-alone method).

Outline of lesson 1: *knowledge* (sub-menu A) (50min)

Introduction: The teacher-centered lesson was started by showing newspaper articles presenting cases of drug abuse and data of the number of drug abuse arrestees. Junior and senior high school data were shown to make the students aware that drug abuse was a real danger to them, despite various measures to fight against drugs.

Development: Students individually learned at their own pace by taking notes in a check sheet for learning items while being cautious of

**Table 2** Item of Investigation and Response Rate (%) relating to Awareness/Attitude \*\* $p < 0.01$ , \* $p < 0.05$

No	Item	Response Rate			Test of difference in population rate			National Survey			
		Pre	Post	F-up	Pre-Post	Pre/F-up	Post/F-up	1997	1999	2000	
2	What impressions do you have about drugs?	1 Cool	0.8	0.8	0.3	N.S.	N.S.	N.S.	1.8	1.0	
		2 Feel good	18.3	16.4	16.9	N.S.	N.S.	N.S.	15.7	11.2	4.3
		3 Effective to diet and sleepiness	4.3	4.6	4.0	N.S.	N.S.	N.S.	4.3	3.7	4.3
		4 Do no harm to mind and body if used only once.	2.4	0.8	0.8	N.S.	N.S.	N.S.	2.7	2.5	
		5 Get ragged mentally and physically.	82.3	90.9	91.9	**	**	N.S.	72.1	73.7	78.2
		6 Involved in crimes	57.5	79.6	78.2	**	**	N.S.	56.4	61.2	38.6
		7 Using and carrying drugs are bad.	68.6	85.8	86.3	**	**	N.S.	73.6	69.3	
		8 'Try them once and you immediately want to try them again (i.e., you cannot stop).'	77.6	89.5	89.0	**	**	N.S.	65.0	77.2	81.7
		9 Nothing special	3.5	1.3	2.2				7.9	6.8	
Awareness	Permissible	24.5	19.4	20.2	*	N.S.	N.S.	26.5	21.1		
	Non-permissible	75.3	80.6	79.8	*	N.S.	N.S.	73.5	78.9		
3	What do you think about using drugs?	1 You absolutely must not use and permit drugs.	73.9	91.1	90.3	**	**	N.S.	82.9	84.2	
		2 Can permit to use them only once if they are harmless to mind and body.	2.4	1.6	2.2	N.S.	N.S.	N.S.	2.5	1.1	
		3 Using drugs is a free choice of individuals because it causes no harm to others.	15.9	4.6	5.1	**	**	N.S.	8.3	8.7	10.3
		4 Others	7.8	2.7	2.4				4.8	5.4	
Attitude	4 Can you explain how people are initiated to drug abuse?	1.2 Can explain.	60.8	94.6	96.2	**	**	N.S.			
		3.4 Cannot explain.	39.2	5.4	3.8	**	**	N.S.			
	5 What do you do if your friend lured you an unknown drug saying that it is a diet pill or pill to make you feel better?	1 I would refuse anyhow.	44.9	73.9	75.0	**	**	N.S.			
		2 I would not use them but I would listen to what my friend says.	47.3	23.9	23.7	**	**	N.S.			
		3.4 I would use them only once.	3.5	0.6	0.8	**	*	N.S.			
		5 I don't know.	4.3	1.6	0.5						
		6 Can you clearly say no if your friend tries to get you to use paint thinner or amphetamines?	95.2	98.7	97.6	**	N.S.	N.S.			
	7 What happens in your view if you use or carry drugs such as stimulants?	1. Punished by the law.	87.9	98.7	98.9	**	**	N.S.			
		2. Only one use will not be punished.	1.1	0.3	0.3	N.S.	N.S.	N.S.			
		3. Only holding drugs will not be punished.	3.8	0.8	0.5	**	**	N.S.			
		4. Will not be punished.	1.1	0.0	0.0	*	*	N.S.			
5. Don't know.		6.2	0.3	0.3	**	**	N.S.				
9 Have you been lured to use drugs?	1.2 Yes	2.7	-	-					2.4		
	3 No	97.3	-	-					97.6		
10 Have you been tempted to use drugs?	1 Yes	5.1	-	-					1.9		
	2 No	94.9	-	-					98.1		
11 Have you studied about drugs? (Where?)	1 School	38.4	-	-				52.5	73.1		
	2 Family	29.6	-	-				21.6	19.4		
	3 Friend	5.1	-	-				7.3	10.4		
	4 Books	43.0	-	-				23.1	27.0		
	5 TV	73.7	-	-				65.8	66.0		
	6 Others	6.5	-	-				4.4	3.1		
	7 No	5.9	-	-							
Subjects (How many subjects?)		372	372	372				8957	8947	209	

National Survey 1997 'Survey Report of Awareness of Drugs such as Stimulant Drugs by Children', October 1997, School Health Education Department of Physical Education Bureau of the Ministry of Education, Science, Sports and Culture: (Male/Female Second Grade Junior High School Students)

National Survey 1999, 'Opinion Survey about Drug Abuse', Public Relations Department of Prime Minister's Secretariat, Prime Minister's Office', November 1999: (15-19yrs)

National Survey 2000, 'Survey Report of Awareness of Drugs', School Health Education Department of the Sport/Adolescent Bureau, March 2002: (Result of Male/Female Second Grade Junior High School Students)

leaving nothing undone. All items in sub-menu A had to be learnt.

Conclusion: Students made up a slogan for drug abuse prevention, typed it by a word processor, printed it out, and presented it.

Outline of lesson 2, Skills (sub-menu B) and Self-esteem (sub-menu C) (50min)

Introduction: The lesson started teacher-centered. Students learnt how to refuse drugs if they were lured to them. They also learnt the importance of developing self-esteem.

Development: Students individually learnt at their own pace by taking notes on a check sheet for learning items while being cautious of leaving nothing undone. All items in sub-menu B and C had to be learnt.

Conclusion: Students discussed what they learnt about drug abuse and its prevention with classmates to verify important points. The teacher took the role of a person who lured students to take drugs, and students practiced refusing it.

Most of the lesson hour was spent on individual learning while students worked on their own computers. Within the timeframe, the teachers walked among them to teach and answer their questions. They also handled computer troubles and checked the progress of learning.

### 2.4. Content of the Survey

A specially designed survey slip (Takaishi, M., 2001) was employed for pre-, post-, and follow-up tests to examine the learning effect. The survey slip was comprised of 14 *knowledge* items, 9 *awareness/attitude* items, 4 *material* items, and a free description section. **Table 2** shows the details of the awareness/attitude items and the result.

### 2.5. Analysis

The response rate and change of response rate were examined. Significance was tested by the difference with the population rate. Then, it was compared

with a national survey (The Ministry of Education, Science, Sports and Culture, 1997, 2000; The Prime Minister's Office, 1999) which used the same survey items.

### 3. Results

This paper reports the changes of awareness/attitude about drug abuse and its prevention, which were the primary educational content of the second lesson.

**Table 2** shows the response rate of the 9 items on awareness/attitude.

The status surrounding the relevant students is the following:

- i) Item 9: 'Have you been lured to use drugs?', 2.7% students had been lured to use drugs. When compared with the result of the national survey (1999), 2.4%, it did not show much difference.
- ii) Item 10: 'Have you been tempted to use drugs?', they marked a rather high rate of 5.1% to the 1.9% result in the National Survey.
- iii) Item 11, which asks about information sources regarding drugs, the highest rate was for 'TV' at 73.7%, followed by 'books': 43.0%, and 'school': 38.4%.

#### 3.1. Items relating to impressions about drugs

(1) The respondents were divided into two groups, in a method similar to the national survey (1997, 2000) by their answers to item 2: 'What impressions do you have about drugs?' The respondents who checked at least one among 1 to 4 and 9 were regarded as the group having permissible impressions about drugs (described as *permissible* in the table). The respondents who did not check any of these answers but at least one among 5 to 8 were regarded as the group having non-permissible impressions about drugs (described as *non-permissible* in the table).

The permissible group decreased significantly from 24.4% in the pre-test to 19.4% in the post-test. In the follow-up test, the group increased a little to 20.2% from the post-test, which made a preferable resulting rate lower than the pre-test. There was a significant difference between the pre-test and post-test. There were no significant differences between the pre-test and the follow-up test and between the post-test

and the follow-up test. The non-permissible group significantly increased from 75.6% in the pre-test to 80.6% in the post-test. However, the follow-up test marked 79.8%, which was a little lower than the post-test and was still preferable compared with the pre-test. A significant difference was observed between the pre-test and the post-test. There were no significant differences between the pre-test and the follow-up test and between the post-test and the follow-up test.

(2) In item 3: 'What do you think about using drugs?', the answer 'absolutely must not use and permit drugs' increased in the post and follow-up tests. The rate changed from 73.9% in the pre-test to 91.1% in the post-test and 90.3% in the follow-up test. The follow-up test yielded a higher rate than the pre-test. Significant differences were recognized between the pre-test and the post-test and between the pre-test and the follow-up test. A wrong individualistic idea of 'Using drugs is a free choice of individuals because it causes no harm to others' greatly decreased from 15.9% in the pre-test to 4.6% in the post-test, and 5.1% in the follow-up test.

Significant differences were observed between the pre-test and post-test, and between the pre-test and follow-up test. However, the answer 'Can permit if used only once.' showed almost no change from 2.4% in the pre-test to 1.6% in the post-test, and 2.2% in the follow-up test.

(3) For Item 2: 'What impressions do you have about drugs?', the answer 5, 'Get ragged mentally and physically' increased from 82.3% in the pre-test to 90.9% in the post-test, and 91.9% in the follow-up test. Significant differences were observed between the pre-test and the post-test, and between the pre-test and the follow-up test. The answer 6, 'Will get involved in crimes' increased from 57.5% in the pre-test to 79.6% in the post-test, and 78.2% in the follow-up test. The follow-up test showed improvement compared with the pre-test. Significant differences were observed between the pre-test and the post-test and the pre-test and the follow-up test. When compared with the national survey, awareness of the danger was much higher in the post-test and the follow-up test. The answer 7, 'Using and carrying drugs are bad.' increased securely from 68.6% in the pre-test to 85.8% in the post-test and 86.3% in the follow-up test. Significant differences were observed between the pre-test and the post-test and between the pre-test and the follow-up test. In

the post-test and the follow-up test, their awareness of the danger was much higher than the respective rates of 73.6% and 69.3% in the national survey. The answer 8, 'Try them once' and you immediately want to try them again (i.e., you cannot stop.)', which asked about awareness of the danger of addiction, improved soundly from 77.6% in the pre-test, to 89.5% in the post-test and 89.0% in the follow-up test. Between the pre-test and post-test and between the pre-test and the follow-up test, significant differences were observed. The national survey yielded 65.0%, 77.2%, and 81.7%, respectively, meaning that their awareness of the danger in the post-test and the follow-up test was very great.

### 3.2. Items relating to skills

These are questions asking if they can reject temptations by imagining real situations.

(1) Item 6: 'Can you clearly say no if your friend tries to get you to use paint thinner or amphetamines', which asks about being lured to take drugs which they are aware of, more than 90% answered 'I can say no' in the pre-test and afterwards. Indecisiveness in 'I am not sure what I will answer' observed 3.8% in the pre-test, and 1.1% in the post-test. The follow-up test marked 2.2%, which was preferably lower than the pre-test. A significant difference was observed between the pre-test and post-test. 'I cannot say no' showed 1.1% in the pre-test. Then, in the post-test and follow-up test, the answer gained almost zero.

(2) To item 5, asking: 'What would you do if your friend lured you to take an unknown drug, saying that it is a diet pill or pill to make you feel better, the answer, 'I would refuse anyhow' greatly increased from 44.9% in the pre-test, to 73.9% in the post-test and 75.0% in the follow-up test. Significant differences were observed between the pre-test and post-test and between the pre-test and the follow-up test. These differences acknowledge great educational effects. 'I would not use them but I would listen to what my friend says' decreased greatly from 47.3% in the pre-test, to 23.9% in the post-test and 23.0% in the follow-up test. The answer, 'I would use them only once' decreased from 3.5% in the pre-test, to 0.6% in the post-test and 0.8% in the follow-up test. These figures also explain the educational effects clearly.

## 4. Discussion

The danger of being lured to use drugs exists everywhere around us. Among the student subjects, 2.7% have been lured to use drugs. This rate of experience with drugs was almost the same as that of the national survey. The source of information on drugs was largely TV, which was similar to an earlier AIDS education survey (Koiso, T, et al., 2002). This was also similar to the national survey. This is a modern tendency. Mass media reports are quick but they are sensational and fragmentary. The CD material is educationally useful because it also includes content on how we should deal with information provided by the mass media.

The rate of students who had been tempted to use drugs was higher than the national value in the pre-test administered to relevant schools. This means that the group had a high risk. However, through the lesson work, impressions of drug use as 'permissible' significantly decreased in the post-test while 'non-permissible' impressions significantly increased. Accordingly, the lesson had clear educational effects. The national survey reported that the rate of 'permissible' respondents increased as the grade was higher. Upper-grade students tended to take the danger of drug abuse more lightly. In contrast, the rate of 'permissible' respondents decreased after this lesson. This evidenced the educational effects of drug intervention. Especially, There were significant differences between the pre-test and post-test and between the pre-test and follow-up test in their sense of strong rejection of drug use. This showed obvious educational effects. As a result, they improved much more than the national survey after the lesson, which was preferable. Also, the wrong individualistic idea that 'Using drugs is a free choice of individuals' was greatly reduced through the lesson work. It had significant differences between the pre-test and the post-test and between the pre-test and the follow-up test. It showed clear educational effects of this lesson and good results surpassing the national survey.

Understanding drug addiction is the most important learning content in drug abuse prevention education. However, some say that the notion of addiction is difficult to understand (Ishikawa, T., 2001). Awareness of the risk of addiction securely improved thanks to this lesson, which was a good result and greatly surpassed the national survey. These results support the significance and usefulness

of teaching lessons in drug abuse prevention education using multimedia (CD-ROM) materials.

The lessons impressed them with the serious adverse effects of drug abuse on our mental and physical health. There were significant differences between the pre-test and the post-test and between the pre-test and the follow-up test. Awareness of the social dangers of drug abuse was greatly enhanced through the lesson. Significant differences were acknowledged between the pre-test and the post-test and between the pre-test and the follow-up test, which were much better results than the national survey. Students at first imagined from the word 'abuse' that drug abuse is repetitive use of drugs. However, awareness that drugs should not either be used or carried improved securely through the lesson. Thus, the educational effects were obvious. The results surpassed the national survey. The lesson made them aware of solid and strong ways to reject drugs.

There was also life skill education, which aimed to foster knowledge-based skills necessary to deal with problems and wants effectively in daily life. The lesson clearly permitted them to acquire skills relating to drug abuse prevention. The students showed clearer rejection and less unclear answers when they were asked if they were lured to use drugs which they were aware of. This apparently explains acquisition of skills to refuse firmly. The simulated experiences in the lesson helped them learn and practice a clear attitude. Thus, the educational effects were obvious. Assuming a scene in which they are lured to take unknown drugs is quite realistic. The practice of this lesson allowed them to acquire skills avoiding risks when unknown drugs are offered. Nevertheless, there were still 20% of students who answered that they would listen to what their friend says even if they did not intend to use drugs. This shows insufficient awareness of risks, in which they may open themselves up and let seducers set them up. Even if they had learned how dangerous and horrified the outcomes are by using drugs 'only once', the answer 'Use it only once' did not turn to zero. In general, junior high school students greatly care about their relationships with friends. Accordingly, some students cannot decline if their friends tempt them to use drugs because they treasure friendship. The temptation of drugs, as the case stands, is still an assumption. Friendship is real. Yet, the lesson showed high educational effects because it improved

their skills to refuse seduction from their friends even if they found it difficult to say no.

## 5. Summary

It is our goal to obviate drug abuse through right knowledge, skill acquisition, and desirable behavior. Especially, drug abuse prevention education to adolescents is thought to be most important because of the following two reasons: 1) they establish their lifestyle during adolescence and tend to have their first experience of drug abuse'; and 2) 'their growth and development is eminent during this period; drug abuse has great adverse effects, causing disorder of the central nervous system and internal organs; drugs obstruct their growth mentally, physically, and socially.' Therefore, the World Health Organization (WHO) and countries worldwide promote and practice drug abuse prevention education.

In the experimental lessons using multimedia materials for drug abuse prevention education to junior high school students, we obtained the following results:

- The lessons applying multimedia allowed for stable management.
- The rate in the 'drug abuse is permissible' group decreased while that of the 'non-permissible' group increased.
- A sense of caution and resistance to drug abuse increased.
- Life skill learning through simulated experiences, which was characteristic of the educational content of the CD-ROM material, helped them form an attitude of denying skills against drug abuse.

The practice and obtained results of the present study are the outcome contributing the development of multimedia education and drug abuse prevention education.

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