

Full Length Research Paper

Awareness and knowledge levels about HIV/AIDS among high school students in Mugla, Turkey

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This study was designed to investigate current awareness and knowledge levels of high school students about human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) in a very popular tourism city Mugla, Turkey. The participants were consisted of 1184 students from 11 secondary schools in Mugla and asked to fill out a questionnaire form, which was consisted of 50 questions. The form contained two scales, one of socio-demographical property of the individuals and the other scale was about knowledge levels of students. The findings present a clear data of the well known dilemma of knowing the right thing and doing wrong about risks of those that should beware of AIDS. The average knowledge levels of students were found to be moderate with a score of 71.15 ± 4.87 . All socio-demographic properties were found to be effective on knowledge levels of students. The results indicated that all students were aware of AIDS and know prevention methods, but they did not know the main target for what or whom they protect themselves.

Key words: High school students, knowledge levels, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), Mugla.

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) was first recognized in 1978, in USA, in healthy homosexual individuals and later it was accompanied by severe, fatal disease. Cause of the disease for these cases was firstly thought as immunosuppressive neoplasm or endocrinological disease and found out to have appeared among young adults. Because first cases were homosexuals, disease was named as "gay compromise syndrome" and "gay related immunodeficiency" (Grani et al., 2005). In 1981 MS Gottlieb (Swenson et al., 1997) diagnosed a fatal infection accompanied by *Pneumocystis carinii* and reported it as "New acquired cellular immunodeficiency". Therefore both name and prognosis of this illness were

well defined and titled as AIDS.

Agent of AIDS was first detected in 1983 and was named as "human immunodeficiency virus (HIV)", in 1986 HIV-2 was also identified (Prescott et al., 2007). Although HIV was determined as cause of AIDS in 1983, analyses of frozen serum samples suggested a similar virus that had infected a sexually active boy in 1968 in St. Louis (Koneman et al., 1997). Subsequently after discovery of HIV, AIDS has quickly become one of the most deadly and feared disease in the world. Beginning of surveillance studies from 1981 to end of 1983, it was detected not only in homosexuals but also at intravenous (IV) drug users (Börsum and Gjermo, 2004; Eggermont, 2005).

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In USA, total cumulative number of AIDS cases was about fifty thousand between 1981 and 1987, but it raised to a quarter million people from 1993 to 1995. During this period around the world, about 10 million cases was detected (Lagerberg, 2004). According to World Health Organization 2008 report, it was about 33.4 million (31.1 to 35.8 million). Since HIV-1 is the major cause of AIDS in the world today, HIV-2 is mostly seen in West Africa region. These patients were either carrier or active AIDS patients. The majority of these cases live in developing countries of Asia, South Africa and Sub-Saharan Africa (Prescott et al., 2007). Beside HIV spreading over world wide, it is also being an emerging problem for Turkey. According to Turkish Ministry of Health data, by June of 2012, 5740 cases were reported, 58.8% of them were between the age ranges of 15 to 39.

As the cause of infection, incidence and prevalence rate of HIV infection continues to rise up in Europe and world wide. Since first discovery of AIDS, many therapeutic approaches were performed for eradication. But today, instead of eradication, suppression of virus should be considered. Nevertheless, today drugs are not used to prevent or eradicate AIDS, but for eliminating opportunistic infections of which HIV infection was triggered. Once a person is infected, eradication of virus from the body is impossible. Additionally, because drug expenses are very high and in developing countries lack of health care organizations, the preventive practices are not feasible. As in other viral infections, success depends on both viral factors and awareness degree of people for prevention of HIV. The awareness degree and related factors of people vary on age, education, gender, socio-economic status, well organized health-care and support activities (Adkins, 2002). It is important that concerted attempts should be performed for sexually active young individuals, through educational and occupational programs to inform them of sexually transmitted diseases (Uwakwe, 2000; Hou, 2009).

Through these estimation attempts, obtained results will be worth full to assess awareness of individuals about HIV. Lessons learned will further our understanding of HIV-related behavioural patterns among young adults and provide insights for developing effective and culturally relevant behavioural intervention strategies. Therefore education is the most important step to prevent spreading of HIV worldwide. For this purpose, this study was designed to examine and to evaluate current awareness and knowledge levels of high school students about HIV/AIDS in Mugla, Turkey.

MATERIALS AND METHODS

The target group for this study consisted of all 11th grade (last grade) secondary school students within age range 16 and 18 years in Mugla, Turkey. The city is located at the Aegean region on

the extreme south west of Turkey with the population of 63,000. Mugla is an important tourism centre with approximately three million visitors from various countries. 1,184 students from 11 secondary schools were asked to participate in our questionnaire. All students were approached by letter and asked for participation by city educational director of Mugla. The research protocol and procedures were reviewed and approved for the ethical considerations by the Educational Director of Mugla and School of Health Sciences Committee. The questionnaire was modification of Dehart and Birkimer's Sexual risk scale (DeHart and Birkimer, 2009). The form was pilot tested with 50 pupils to identify reliability and where revision might be essential. Major revisions were made to facilitate understanding and applicability of questionnaire.

The final questionnaire form consisted of 50 statements and contained two scales: (i) 15 personal questions related to socio-economical situation "such as, salary income, information about their family, source of information etc.", (ii) 35 questions about knowledge levels related to HIV and AIDS. At this second section, students replied the questions by one of three answers; true, false or do not know. Scoring was performed as, one point for correct answers and zero point for false or not known questions. The maximum score was 35 points and later converted to hundred scales and evaluated. Therefore, knowledge level scores of 0 to 50 points (0 to 18 true answers) were concerned as less, 51 to 75 (19 to 27 true answers) as moderate and above (≥ 28 true answers) as well.

The demographic variables and individual items were analyzed using descriptive statistics. The results were analyzed statistically with the statistical package for social sciences (SPSS) program. The socio-demographic data were collected as independent variables, where knowledge level scores were as dependent variables.

RESULTS

1184 secondary school students participated in our questionnaire with age range 16 to 18 years, and their socio-demographic findings were summarized in Tables 1 to 4. Over half of the students were female (53.5%) and 46.5% of the students were male. The average knowledge levels of students were found to be moderate with a score of 71.15 ± 4.87 . According to our results, knowledge levels of female (73.1 ± 5.75) were higher than male (69.3 ± 5.91), thus gender is an effecting factor of knowledge (Table 1). In another word, a significant correlation was detected between gender and knowledge levels ($p < 0.05$).

A total of 66.6% of the students' parents had 750 TL ($\approx$ 500 US dollars) and above income per month. As depicted in Table 2, obtained data indicated that there was a significant correlation between salary income and knowledge levels ($p < 0.05$). Income rates might directly or indirectly affect the knowledge levels of students and can be suggested that the more the gained money the more students got knowledge. Additionally, schooling levels of parents evaluated and statistically analyzed whether there is correlation between knowledge levels and schooling levels of parents. As summarized in Table 3, most of the parents were primary schools, with the rates of 60.5 and 49.3% for fathers and mothers,

Table 1. Gender versus knowledge scores.

Parameter		Score (%)			Total (%)	X
		Less	Moderate	High		
Gender	Male	Count	116	208	309	69.3±5.91
		Gender	18.4	32.8	48.9	
		Score	61.1	58.8	48.2	
		Total	9.8	17.5	26.1	
	Female	Count	74	145	332	73.1±5.75
		Gender	13.4	26.3	60.3	
		Score	38.9	41.2	51.8	
		Total	6.3	12.3	28.1	
Total	Count	190	353	641	1184	71.15±4.87
	Gender	16.1	29.8	54.2	100.0	
	Score	100.0	100.0	100.0	100.0	
	Total	16.1	29.8	54.2	100.0	

X: Avarage knowledge score (100).

Table 2. Salary income of the family versus knowledge levels.

Parameter		Score (%)			Total (%)	X
		Less	Moderate	High		
Income (TL)	0-750	Count	101	140	154	65.0±5.92
		Income	25.6	35.4	39.0	
		Score	53.2	39.8	24.0	
		Total	8.5	11.8	13.0	
	751-1500	Count	64	157	284	72.4±5.40
		Income	12.7	31.1	56.2	
		Score	33.7	44.6	44.3	
		Total	5.4	13.3	24.0	
	1501 and above	Count	25	55	204	77.7±5.67
		Income	8.8	19.4	71.8	
		Score	13.2	15.6	31.7	
		Total	2.1	4.6	17.2	
Total	Count	190	352	641	1184	71.15±4.87
	Income	16.1	29.8	54.2	100.0	
	Score	100.0	100.0	100.0	100.0	
	Total	16.1	29.8	54.2	100.0	

X: Avarage knowledge score (100), TL: Turkish Liras.

respectively. Knowledge levels of students who had primary school level educated father and mother were 67.9 ± 5.8 and 66.8 ± 5.81 , respectively. 14.7% of mothers and 23.1% of fathers of the participants

graduated from university and knowledge levels of the students were observed as 79.2 ± 5.54 and 78.1 ± 5.39 , respectively (Table 3). There is a statistically significant correlation between knowledge levels of students and

Table 3. Educational status of mothers and fathers versus knowledge scores of students.

Education status	Score							
	Less		Moderate		High		Total	
	N	%	N	%	N	%	N	%
Mother								
Not literate	10	0.8	13	1.1	14	1.2	37	3.1
Primary school	142	12.0	247	20.9	327	27.7	716	60.5
Secondary school	24	2.0	73	6.2	160	13.5	257	21.7
University	14	1.2	20	1.6	140	11.8	174	14.7
Total	190	16.1	353	29.8	641	54.2	1184	100.0
Father								
Not literate	4	0.3	5	0.4	2	0.2	11	1.0
Primary school	127	10.7	213	18.0	244	20.6	584	49.3
Secondary school	40	3.4	82	6.9	193	16.3	315	26.6
University	19	1.6	53	4.5	202	17.1	274	23.1
Total	190	16.1	353	29.8	641	54.2	1184	100.0

X: Avarage knowledge score (100); N: Count

Table 4. Source of information and knowledge scores.

Source	Count % (in group)	%	X
Family	14 (1)	1.2	65.3±7.63
School	442 (41)	37.3	70.9±7.63
Media	99 (9)	8.4	63.4±6.55
Books and magazines	23 (2)	1.9	70.7±6.24
Others	30 (3)	2.5	66.8±5.71
More than one source	472 (44)	39.9	72.2±6.36
Total	1080 (100)	91.2	72.6±5.53
Not informed	104 (100)	8,8	55.7±6.55
Total	1184	100.0	71.15±4.87

X: Avarage knowledge score (100)

education levels of parents ($p < 0.05$). As suggested in Table 3 in case of schooling levels of parents which become high, knowledge levels of students increased.

As summarized in Table 4, the most common reported source of information for both male and female students was school educational programs (41%) and 43.7% of the students gained information from more than one source. Family and books were reported as the least accessed source of information. 91.2% of the students reported that they were informed about HIV/AIDS previously by various educational materials. When we assessed the knowledge levels of not informed students, the knowledge level was the least as 55.7 ± 6.55 . There was a strong correlation between knowledge levels and informational status ($p < 0.05$). With respect to source of

information, the students who got informed by school educational programs or more than one source had higher awareness and knowledge with a score of 70.9 ± 7.63 and 72.2 ± 6.36 , respectively (Table 4). Given answers to question about being in sexual activity, 40.5% of the students answered yes, but 29.3% of them did not reply the question. In respect to the given answers, the findings present a clear data of the well known dilemma of knowing the right thing about how to prevent spreading AIDS and doing wrong about risks to those they should beware of. The brief summary of giving wrong answers by the students were listed below and given answers, counts of wrong answers and wrong answer percentages in brackets were given, respectively.

1. AIDS is a virus caused, curable illness (Yes, 47.0%);

2. HIV can be transmitted by swimming in a pool with infected person (Yes, 31.8%);
3. HIV can be transmitted by sharing comb/brush (Yes, 33.3%);
4. Cannot be transmitted by sharing injectors (Yes, 60.7%);
5. Can be transmitted by insect or mosquito bites (Yes, 43.7%);
6. Drugs using for therapy of AIDS does not eliminate HIV but can inhibit growing (No, 39.0%);
7. Inadequate cleaning of barbers' or dentists' equipments do not effect transmission of virus (Yes, 33.4%);
8. Piercing, tattoo are risky behaviors for spreading AIDS (No, 30.2%);
9. Perspiration has the least risk for spreading of HIV (No, 45.8%);
10. Carriers can be seen as healthy, shows no symptoms of illness and these patients do not transmit disease (Yes, 55.7%);
11. IV drug users are at great risk of HIV (No, 35.8%);
12. Hemophilia patients, health care staff, because they are in relation with blood products probably at risk of being infected (No, 32.0%);
13. Enzyme-linked immunosorbent assay (ELISA) is the name of diagnostic test (No, 42.3%);
14. A vaccine was developed for HIV (Yes, 51.9%);
15. Patients must be isolated from the public (Yes, 40.6%);
16. Do not let patients to marry (asked for personal comment; Yes, 73.8%).

DISCUSSION

An early onset of sexual activity in young adolescents has been associated with various health issues. Adolescents who initiated early sexual activity are less likely to take appropriate precautions, and are at possible risk of contracting a sexually transmitted disease and various kinds of problems (Adkins, 2002). According to Turkish Ministry of Health data, the first case was diagnosed in 1985 in Turkey. 52.7% of the reported AIDS cases have resulted from heterosexual relationships (Statistics of Turkish Ministry of Health, 2011).

Reports from various studies have suggested that two thirds of the AIDS cases among adolescents have resulted from sexual behaviour. These rates showed significant differences between countries. These discrepancies may vary among population depending on social behaviour, cultural background, religion, education, economical status, age and gender differences and awareness of population. Additionally also educational programs given by medical personnel, mass media, and family members can also affect ratios of AIDS cases and

transmission routes (Grani et al., 2005; Nath, 2009). Because AIDS is still not a curable illness, the main goal denses towards informing individuals about the modes of transmission, emphasize the importance of prevention rather than curing illness (Muinonen et al., 2002).

According to previous studies performed in USA, statistics of AIDS related knowledge levels and behaviour showed significant differences in general population. People with < 12 years of education and individuals over the age of 50 are likely not to respond correctly to general AIDS knowledge questions (Swenson et al., 1997). These analyses allowed researchers make two basic decisions about fighting against AIDS. First, it is impor-tant to focus research and interventions on young people. Second, those young adults who differ in education and in cultural background should be separately studied (Yadav et al., 2011).

Studies of young adolescents suggest that they have quite high level of knowledge about HIV/AIDS; these include transmission, prevention and general. And sources of information were mostly as mass media, family members and friends or medical personnel (Swenson et al., 1997; Yadav et al., 2011). Previous studies reported similar average results about information sources varying among countries according to living conditions. Adolescents had many different sources of information available. School and media aimed at prevention programs (95%), parents (39%), books (39%), television (19.3%) and physicians (3%) are the most common sources (Eggermont, 2005; Nath, 2009).

According to our study groups' economical status, salary incomes directly or indirectly affect the awareness of students. It can be suggested that the more the gained money, the more students get knowledge. The participants who had less money had less knowledge level like 65.0 ± 5.92 and in opposition to this, whose family had more income rate, and had the most knowledge level as 77.7 ± 5.67 . There is a statistically significant relation between salary income and knowledge levels of participants.

In our study, only 1.4% of participants indicated family as an information source but schools were the main source with a ratio of 41%. Beside these observations, more than one information sources (43.7%) played an active role in education for HIV/AIDS. 8.2% of the students whose knowledge level was 55.2 ± 6.55 said that they never had any information from anywhere. However the avarage knowledge level of students who got informed from more than one source was 72.6 ± 5.53 ($p < 0.05$). Schooling could therefore be associated with either an increase or a decrease in the risk of HIV infection depending on the different influences on behaviour. But in recent years, improvement in sexual health education concerning HIV given in schools should also guide to safer sexual behaviour and awareness of

HIV/AIDS among young people (Muinonen et al., 2002; Hou, 2009). These efforts might be effective for prevention of HIV spreading as many articles emphasized. In opposition to these, many studies performed in Africa suggested that in general, population have either shown no association between education and HIV-1 infection status or increase in HIV risk with increasing education and few studies showed higher risk of HIV infection among those with more education than among those with less education (Glynn et al., 2004). We have also explored associations between family education level and students' knowledge level ($p < 0.05$). Knowledge levels of students whose mothers and fathers are not literate were 66.7 ± 5.36 and 60.3 ± 4.68 , and whose relatives have university degree were 79.2 ± 5.54 and 78.1 ± 5.39 , respectively. These observations suggested that improving general education levels as well as targeting health messages were more effective for those with poor education and empowered them to act on them.

Besides education level, socio-demographic status and living conditions can play an important role in changing sexual behaviours, being aware of sexually transmitted diseases and prevention of AIDS spreading (Glynn et al., 2004; James et al., 2004). The interaction between gender and knowledge levels reflects statistically significant relation. Knowledge levels of females and males were 73.1 ± 5.75 and 69.3 ± 5.91 , respectively ($p < 0.05$). According to previous studies, gender criteria did not show efficient influence on knowledge and those results vary (Edgardh, 2002; Muinonen et al., 2002; James et al., 2004). 40.5% of the students were stated as sexually active.

In recent studies, it was reported that sexual activity has increased and attitudes have changed through having first sexual intercourse at a younger age and increase in the reported numbers of sexual partners. Students who had sexual intercourse at a younger age and had many sexual partners continue to have high number of sexual partners, regardless of their level of knowledge and awareness of AIDS (Lagerberg, 2004; Mahat and Scoloveno, 2006). Our results about sexual activity ratios were compatible with those reported in studies; likely, most of sexually active young adolescents were male. Although average knowledge level of the students is 71.15 ± 4.87 , some answers to the questionnaire reflected that, students were not informed adequately. 47% of the students thought AIDS as a curable disease; also 60.7% of them believed that HIV cannot be acquired by contaminated needles or injections. 55.7% of students revealed that HIV carriers do not seem to be ill, thus it is not a transmittable disease. Students had also misconceptions about how HIV is transmitted, such as 43.7% of students who thought that HIV can be transmitted by mosquito or likely insect bites. Interestingly, 51.9% of the participants

thought that there is a vaccine against HIV. Reported in a previous study of Mahat and Scoloveno (2006), 93.3% Nepalese adolescents were aware that HIV is not transmitted by mosquito bites, and also 75% of Ethiopian adolescents and 40.3% of Turkish adolescents either. Yadav et al. (2011) also revealed that youths were less aware of transmission routes of infection. Mahat and Scoloveno (2006) also reported that Nepalese adolescents in their study had moderate level of AIDS knowledge, but there was need for improvement because of uneven knowledge in the subcategories of mode of transmission, prevention and perceived risk.

In previous studies by Serlo and Asvarinne (1999) and Uwakwe (2000), the ratio of true answers was higher than our observations. Participants revealed that blood donation, insect bites and toilet seats might be risky for HIV infection with a ratio of 47.3, 22.4 and 16.3%, respectively. It would be a safe assumption to assert that the relationship between knowledge and attitudes among health care workers would appear to have followed a similar pattern to that observed within the general public. Despite relatively high levels of knowledge about AIDS and its mode of transmission, levels of fear about the disease and prejudicial attitudes towards AIDS and patients decreases but remains. Educational programs may prevent fear or prejudicial attitudes. For instance, by systematic HIV-AIDS educational programs, health care workers led to positive changes in the participants' knowledge attitudes and compliance with HIV/AIDS (Snowden, 1997). To make clear of students individual beliefs about HIV patients and permission about marriage, 73.8% of students thought that AIDS patients are never permitted for marriage and 40.6% of students indicated that these patients should have been isolated from population.

CONCLUSION

In this study, majority of the students was aware of the mode of HIV/AIDS transmission and knew its prevention methods. However they did not know the main target for what or who against they protect themselves.

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