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Original Article

Public Health Section

Cancer Knowledge, Attitude and Protective Behaviour in High-School Students: A Cross-sectional Analytical Study in East Azerbaijan, Iran

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ABSTRACT

Introduction: Providing and enhancing knowledge, attitude, delivering and conduction of evidence based information and beliefs about all aspects of cancer in adolescent life period are so important.

Aim: The study aimed to evaluate and investigate the main information regarding knowledge, attitude and protective behaviour on high-school student of Tabriz City, East Azerbaijan, North West of Iran.

Materials and Methods: This study was performed as a cross-sectional analytical research study, during the 2017 Sep-2018 June academic year, in randomly selected high-schools. Questionnaire was designed and implemented which included socio-demographic information and 65 questions with three answers from disagree, agree, completely agree, and each answer was given from 1 to 3 marks. Question were about the knowledge (n=20; 0-20 poor, 21-40 moderate, 41-60 good), attitude (n=20; 0-20 poor, 21-40 moderate, 41-60 good) and protective behaviour (n=25; Protective Behaviour: 0-25 poor, 26-50 moderate, 51-75 good) regarding cancer. The response options designed as Likert scales and each variable scored from worst to best status and the total scores as 0-40 (very poor), 41-80 (poor), 81-120 (moderate), 121-160 (good) and 161-195 (very good).

Results: Overall 471 students participated in this survey, between 14-19 years with mean age of 16.79 years. The total mean score of knowledge, attitude and protective behaviour was 136.05 (±SD 3.24) which was considered as good. Total scores was significantly higher in better Socio-Demographic Status (SDS), students with moderate SDS had 3.85 times and students with good SDS had about 2 times higher total scores. Total scores were twice among16-17 year-old group than younger students (OR=1.97; 95% CI: 1.03-3.76, p=0.04).

Conclusion: The results indicated better levels of knowledge, attitude and protective behaviour regarding cancer in high-school students. SDS had significantly impact on the total knowledge levels.

Keywords: Awareness, Educational program, Neoplasm, Orientation

INTRODUCTION

Chronic diseases, particularly cancer, are the most challenging health problem in the public health system around the world and cause major economic and psychological burdens and lead to death. However, many cancers can be prevented by early detection and identification of common risk factors. Most recently, there has been a belief that a cancer tsunami will occur soon, but it should be known that the most increasing patterns of cancer incidences in last decade has been attributed to population growth and aging of populations, especially in developing world [1-3].

Many evidences revealed that basic knowledge and awareness about cancer and known risk factors is suboptimal in Iran [4-9]. There was good level of knowledge on cancer prevention in some other Asian countries [10-12]. However, health behaviours of students were mostly influenced by family educations and cultures. But, there is still necessity to develop further comprehensive educational program as integrate school-based and population educations and possible preventional guidelines. Several studies evaluated the effect of health education program on students' Knowledge, Attitude and beliefs about cancer prevention Behaviours (KAP), and strongly emphasised that health education to at-risk groups and also target groups have an important role in controlling and managing cancer by improving their attitude and behaviours [12,13].

Increasing public awareness and knowledge about cancer, risk factors, screening and early detection modalities of preventable cancers are the main aims of public health policy makers. Moreover, evaluation and assessment of populations' awareness and their knowledge about cancer and its circumstances is valuable, as the corner stone of population based cancer prevention programs in each community. Starting this, survey from young adult population is also emphasised, because the significance of correcting their beliefs and providing true and evidence based information about all aspects of cancer. Also, these young people are the future makers of every country, and should have enough knowledge and awareness about public health problems and cancer as well [14-18].

Providing feasible assessment tool and/or questionnaire about population's primary knowledge and beliefs about risk factors, prevention, early detection and main information of cancer is the first step in cancer research studies. So, this survey in young adults was began, mainly in high-school students of Tabriz, East Azerbaijan, North West of Iran. Previous similar studies in the country revealed that limited awareness and information were provided for young adolescents and students about cancer [4-8]. As there is no information about high school students KAP about cancer in this region, it was aimed to evaluate and investigate information and knowledge of students about cancer and risk factors in young population to know their general awareness about all cancers, the desired factors, and protective behaviour. Also, some information provided about risk factors of most common cancers, early detection, screening modalities, healthy diet and life style rules as educational pamphlets for all of the students. As of our knowledge, this study was performed for the first time in East Azerbaijan regarding cancer knowledge and attitude in high school students.

MATERIALS AND METHODS

Written informed consent was obtained from all participants and they were informed that participation was voluntary, and all personal information was confidential. The ethical permission was received from manager desk of high schools (no 56/7, date 10 Sep 2017). Also, an educational pamphlet was designed and provided freely for all participants, also a face-to-face discussion and conversation has been performed by the main researcher (KFD).

This study was performed as a cross-sectional analytical research study, on high-school students from different region of Tabriz City, East Azerbaijan, North West of Iran, from 22 September 2017 to 19 June 2018 (academic year in Iran). Based on previous similar study [19], and using STATA software, the least value of the Odds Ratio (OR) 2, and by considering a 95% confidence level, 90% Power, with α error=0.05, and 20% for dropout, the sample size resulted 500 cases. The study subjects' of 500 students, selected as simple randomisation from 4 different high-schools who agreed to answer the questionnaires and participated in study. The schools were selected randomly from four main regions, one school from each formal educational area of Tabriz City. In Iran, students started the high-school from 14 years old and duration was 6 years.

Inclusion criteria: Participants were aged between 14 to 19 years, high-school students and living in Tabriz.

Exclusion criteria: Participants unwilling to participate in the study.

Instrument

Questionnaire was designed and implement according to researchers' aims and scopes using references [13,19,20]. This questionnaire was a Persian self-administered, anonymous, easy to answer tool and needed about 10-15 minutes to fill. The scientific validity of the instrument was determined by the validity of the content. The reliability of the instrument was also calculated by Cronbach's alpha coefficient. The average estimated Cronbach's alpha coefficient was 0.79, with Spearman's Brown Correlation of 0.68 in this reference study [19].

First the socio-demographic information was obtained, which has been validated before [13] and contains questions about parent(s) current marital status, parent(s) education, residency, and family income. For family income, it was somehow difficult to identify income amounts per month in Iran, so it was categorised as family satisfaction level as low, moderate, good, and very good. The response options were designed as Likert scales and each variable scored from worst to best status and the total scores indicated the SDS. Based on reference [13], the cut-points used for SDS were considered as poor for 1-5, moderate for 6-10, good for 11-15, and perfect for >15 scores.

Then 65 questions were provided about the knowledge (n=20), attitude (n=20) and protective behaviour (n=25) regarding cancer, in general for all cancers [13,20]. They were assessed with three answers from disagree, agree, completely agree (means that I agree with every aspect of this question) and coded as Likert scales (score ranges are provided below). Knowledge dimension was evaluated about cancer causes, risk factors, chemical and hazards exposures, dietary and life-style factors; attitude about self-perceived risk of cancer, perception of general beliefs about cancer cause, cancer treatment, cancer prevention; and Protective behaviours, beliefs about early detection and screening modalities for most common cancers in world, Iran and East Azerbaijan; modification and improvement of dietary and life style habits; avoid risky habits attributed to cancer were assessed. First, the scores were calculated for each sub-category:

Knowledge: 0-20 poor, 21-40 moderate, 41-60 good;

Attitude: 0-20 poor, 21-40 moderate, 41-60 good;

Protective behaviour: 0-25 poor, 26-50 moderate, 50-75 good.

In order to better assess the level of knowledge, attitude, and protective behaviours, the total scores obtained in these areas (for knowledge, attitude, and protective behaviour) were summarised and then categorised into five groups from worst to best status as: 0-40 (very poor), 41-80 (poor), 81-120 (moderate), 121-160 (good) and 161-195 (very good).

Student volunteers, after receiving information about the aims and methods of study and after getting consent forms, involved in study. Filled questionnaire were gathered and primary information were summarised in excel file. The results were registered and recorded, and each criteria were scored according to defined measurement and scales. After calculating the scores of knowledge, attitude, and protective behaviour, all scores were summarised and converted to range.

STATISTICAL ANALYSIS

Demographic data and average score results were analysed using STATA MP 14.2 (Stata Corp LP, College Station, Texas 77845 USA). Basic descriptive data were presented as number and percentages for nominal, and mean±standard deviation for numeric variable. The normality of numeric data was tested by Skewness and kurtosis tests. Multinomial Logistic regression analysis was performed to assess any relationship between socio-demographic factors and knowledge and attitude, and behaviour scores. Adjusted Odd Ratios (ORs) along with 95% Confidence Intervals (CIs) were presented. Two tailed p-value was considered significant at ≤0.05 level. The dependent variable was the total score of knowledge, attitude and protective behaviours' scores, as was multinomial as: Very Poor, Poor, Moderate, Good, and Very Good.

RESULTS

From 500 enrolled students, 471 students accepted to participate in this survey, 251 (53.3%) were male and 220 (46.7%) were female. They were between 14-19-year-old with mean age of 16.79 (±SD 1.22) years. A total of 232 (49.3%) students had positive family history at least one from any cancer. The mean SDS was 11.68 (±SD 2.02) with range of 6 to 18 scores, which was considered almost good according to the defined category. Most of the students was in good SDS (332, 70.5%), and 130 (27.6%) in moderate SDS, and just 9 students (1.9%) were in perfect SDS [Table/Fig-1].

For knowledge, attitude and protective behaviours the scores were calculated separately and then the total scores were gained. The total mean score for three dimensions, in 471 students was 136.05 (±SD 3.24) which was considered as good according to the defined categories. From these 73 students (15.5%) had moderate and 398 students (84.5%) had good total scores. None of the 471 students had very poor, poor and very good total scores [Table/Fig-2].

Multinomial regression analysis was performed, and the dependent variable was score of knowledge, attitude and protective behaviours' and their total scores, as was multinomial. Main effects were used like model, included intercept, and model fitting information. 95% CIs and likelihood ratio tests were assessed, and covariate patterns by factors were defined.

The results showed that SDS had some effects on each skills, as students with higher SDS had higher knowledge, attitude, and protective behaviours. Students with good SDS had about 2 times higher knowledge scores (OR=2.25; 95% CI: 1.59-8.58), about 3 times higher attitude scores (OR=2.92; 95% CI=1.74-11.45), and about 4 times higher protective behaviour scores (OR=3.76; 95% CI: 1.98-7.13, p=0.001).

Total scores of knowledge, attitude and protective behaviour was significantly higher in better SDS of students, as students with moderate SDS had 3.85 times higher total scores (OR=3.85; 95% CI=2.03-7.29, p=0.001) and students with good SDS had about 2 times higher total scores (OR=1.94; 95% CI=1.42-4.91,

Variable		Number	Percentage (%)
Sex	Male	251	53.3
	Female	220	46.7
Age groups (years)	14-15	130	27.6
	16-17	157	33.3
	18-19	184	39.1
Parent marriage status	Married	215	45.7
	Divorced	117	24.8
	Widow	82	17.4
	Unknown	57	12.1
Residency	Private	185	39.3
	Rental	180	38.2
	Unstable (Didn't have stable place for residency, no private and no Rental)	58	12.3
	Unknown (Students didn't give us any information about their residency)	48	10.2
Mother's education	Illiterate	44	9.3
	Primary school	144	30.6
	High school	137	29.1
	University	146	31.0
Father's education	Illiterate	32	6.8
	Primary school	138	29.3
	High school	146	31.0
	University	155	32.9
Family income satisfaction	Low	80	17.0
	Moderate	173	36.7
	Good	112	23.8
	Very good	106	22.5
Socio demographic status	Poor	0	0
	Moderate	130	27.6
	Good	332	70.5
	Perfect	9	1.9

[Table/Fig-1]: Summary of descriptive statistics of socio demographic factors in 471 high-school students, in Tabriz, East Azerbaijan during 2017-2018 academic year.

Variable	Scores	Number	Percentage (%)	Total mean (±SD)
Knowledge	Poor (0-20)	-	-	42.51 (±3.13)
	Moderate (21-40)	126	26.8	
	Good (41-60)	345	73.2	
Attitude	Poor (0-20)	-	-	52.11 (±3.24)
	Moderate (21-40)	170	36.1	
	Good (41-60)	301	63.9	
Protective behaviour	Poor (0-25)	-	-	41.44 (±2.89)
	Moderate (26-50)	71	15.1	
	Good (51-75)	400	84.9	
Total scores	Very poor (0-40)	-	-	136.05 (±3.24)
	Poor (41-80)	-	-	
	Moderate (81-120)	73	15.5	
	Good (121-160)	398	84.5	
	Very good (161-195)	-	-	

[Table/Fig-2]: Summary of descriptive statistics of knowledge, attitude, and protective behaviour scores in 471 high-school students, In Tabriz, East Azerbaijan during 2017-2018 Academic year.
SD: Standard deviation

p=0.001) and these differences were statistically significant. Also, male students had slightly higher total scores compared to female students (OR=1.15; 95% CI=0.69-1.89, p=0.59) but this was not statistically significant. Increasing age of the students their total scores were significantly increased, but the higher total score was obtained in 16-17th age group, which 16-17 old-ages had about 2 times higher total scores than 14-15ths (OR=1.97; 95% CI=1.03-3.76, p=0.04). Positive family history at least one, from any cancer didn't have significant association with knowledge scores at all [Table/Fig-3]. The choice of variables was taken after the discussion with statistician in this [Table/Fig-3].

Variable		Number	Percentage (%)	*OR	†95% CI		p-value
					Lower	Upper	
Age (years)	14-15	130	27.6	Reference	-	-	**0.001
	16-17	157	33.3	1.97	1.03	3.76	0.04
	18-19	184	39.1	1.02	0.52	2.01	0.95
Sex	Male	251	53.29	1.15	0.69	1.89	0.59
	Female	220	46.71	Reference	-	-	**0.45
Positive family history	Yes	232	49.26	0.98	0.54	1.57	0.62
	No	239	50.74	Reference	-	-	**0.54
SDS [13]	Poor	0	0	Reference	-	-	**0.00
	Moderate	130	27.60	3.85	2.03	7.29	0.001
	Good	332	70.49	1.94	1.42	4.91	0.001
	Perfect	9	1.91	-	-	-	-

[Table/Fig-3]: Multinomial logistic regression analysis results for adjusted odds ratio about association of variables and total Knowledge, Attitude and Protective Behaviours' scores.
Multinomial logistic regression test; *: Odds ratio; **: Total p-value; †CI: Confidence interval; p-value ≤0.05; SDS- Socio-demographic status

DISCUSSION

The aim of this cross-sectional analytic study was to evaluate the main aspects of knowledge, attitude and protective behaviour regarding different aspects of cancer including risk factors, cancer cause, cancer treatment, cancer prevention, and cancer early detection and screening. The study also evaluated the SDS of 471 male and female high-school students, from 4 randomly selected high-schools of Tabriz, East Azerbaijan and assess any relationship between SDS and knowledge, attitude and preventive behaviour's total scores. The higher SDS was significantly associated with higher knowledge levels of students, as students with moderate SDS had about 4 times and students with good SDS about 2 times higher levels of knowledge, attitude and protective behaviour. The results showed better levels of knowledge, attitude and protective behaviour levels at all high-school students of Tabriz as about 84.5% had higher scores which defined as good level. Also, as students get older their knowledge, attitude and protective behaviour levels increased significantly.

Although there were few studies about knowledge and attitude about all aspects of cancer in general populations, there were limited studies on high-school students, at least in Iran [4-8,19]. So, because of the importance and significance of these age groups as the main future makers of communities, this study was performed. Some free educational pamphlets were provided including main risk factors of most common cancers, early detection and screening modalities, and healthy diet and life style rules. Also, the last information about most common cancers statistics in East Azerbaijan was provided using the results of East Azerbaijan Population Based Cancer Registry data as a book for all of the students.

There was disparity and conflicting results about knowledge and attitude and SDS in high-school students. There were very low knowledge levels in male and female high-school students [21,22], even in developed world in high-school students [23,24]. Lack of knowledge, attitude and behaviours was obvious in high-school students of Saudi Arabia, while the mean knowledge index was 22.9% [22,25]. Many students reported that they may have heard about

any aspects of cancer, but low percentage of them had any attitude and interest to find scientific and descriptive information about the same [22]. However, the results showed a good knowledge, attitude and protective behaviour levels, comparing with previous reports from Iran and East Azerbaijan [5,26-29]. Having at least one positive family history has a large impact on young adolescents to have attitude about any cancer and risk factors [22,23]. In this study, any association between positive family history and knowledge levels in the high-school students did not found.

Providing and enhancing knowledge and attitude and deliver and conduction of evidence based information and beliefs about all aspects of cancer in adolescent life period is so important, as it provides accurate teaching skills and shaping health behaviours and beliefs into adulthood in early stages of their life [21,30]. These knowledge and skills can help and empower young adolescent to play main roles in their healthy life style and risk factor controls and responsibility for their own and family, friends and relatives health behaviours [21]. Conducting educational interventions, training and raising the knowledge levels of students have had significantly efficient impact in high-school students' knowledge, attitude and protective behaviour regarding all aspects of cancer [30]. It has been well established that educational programs had significantly positive effect on promote awareness, attitudes and preventive behaviour of cancer, in high-school students [4,19]. So developing and establishing evidence based education and giving the right information in young adolescent group is strongly recommended. Public health policy makers and cancer epidemiologists are responsible to design and implement continuous educational training programs for young adults, even starting from primary schools and enhancing to high-schools and continue at university levels [31].

SDS had a strong impact on knowledge and attitude levels of high-school students. Parent(s) higher educational levels help young adolescent to be more interested and curious about updated information about cancer, while most of the students received their knowledge from their parent (s). Educated families are the most important source of information in theses age groups [30]. Also, according to previous experiences most adolescents gain their knowledge and information from different media sources [23,24]. Access and availability of these sources is mostly dependent to SDS of families and their provided facilities for their children. Meanwhile higher educated parent (s), provide more and accurate information about risky behaviours regarding cancers, and then better protective beliefs and behaviour like smoking, dietary habits and life style factors [14,32-36].

Knowledge, attitude and protective behaviour levels was obviously higher in 16-17 age group in this study compared with younger students, which has been reported to other similar studies [14]. As students get older, increasing the total knowledge levels is rational but most of the students in 18-19 age groups had some more responsibility about their school courses and university entrance exams, so this may have led to less time and lower knowledge [14].

As of our knowledge, this study was designed and performed for the first time in East Azerbaijan, about knowledge, attitude and protective behaviour in high school students. The study enrolled 500 students, and about 95% of them (n=471) participated in this study. Also, the study provided some free educational pamphlets for students for increasing their KAP, acknowledging for participating and taking the time for this study. Most of the students had good (n=332, 70.5%) socio demographic status. This was mostly due to the selection of private schools from the urban areas, and availability of the students.

Limitation(s)

The limitation of this study was the limited included schools from study region. More comprehensive studies with a larger sample size from all urban and/or rural areas of the region are recommended.

CONCLUSION(S)

In conclusion knowledge, attitude and protective behaviour regarding cancer has been increased in the high-school students. As family knowledge and attitude is so important in increasing the students' interests and attitude regarding cancer, so increasing knowledge and attitude at population levels and providing some training courses for students and their families is strongly recommended. It is extremely essential to establish programs and activities that increase awareness among both male and female high-school students and the community at large scales about the main risk factors of cancer, preventional and early diagnostic modalities. Health policy makers should provide additional information about controlling and reducing main cancer risk factors, to help young adolescents to have healthy habits and share their knowledge with population.

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Authors' contributions: RD, designed of the study, supervised the project, abstraction data, and analysis of data, prepared the draft of the paper and finalised it based on the comments from the other author. KFD, participated in the data collection and registration, data linkage, prepared the first draft of manuscript.

REFERENCES

[1] Global Burden of Disease Cancer Collaboration. Global, Regional, and National Cancer Incidence, Mortality, Years of Life Lost, Years Lived With Disability, and Disability-Adjusted Life-Years for 29 Cancer Groups, 1990 to 2017: A Systematic Analysis for the Global Burden of Disease Study. JAMA Oncol. 2019;5(12):1749-1768. doi:10.1001/jamaoncol.2019.2996

[2] Cai Z, Liu Q. Understanding the Global Cancer Statistics 2018: Implications for cancer control. Sci China Life Sci. 2019.

[3] Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68(6):394-424.

[4] Nadrian H, Rahaee Z, Mazloomy Mahmoodabad SS, Bahrevar V, KHajeh Z, Najafi S, et al. Effects of educational intervention on promoting skin cancer preventive behaviours and its predisposing factors among female students in Yazd city: An application of some PRECEDE Model constructs. Razi Journal of Medical Sciences. 2014;21(1256):55-64.

[5] Abazari F, Haghdoost A, Abbaszadeh A. The Relationship between Students' Bonding to School and Multiple Health Risk Behaviours among High School Students in South-East of Iran. Iran J Public Health. 2014;43(2):185-92.

[6] Haghdoost A, Abazari F, Abbaszadeh A, Dortaj Rabori E. Family and the risky behaviours of high school students. Iran Red Crescent Med J. 2014;16(10):e15931.

[7] Asgarlou Z, Tehrani S, Asghari E, Arzanlou M, Naghavi-Behzad M, Piri R, et al. Cervical cancer prevention knowledge and attitudes among female university students and hospital staff in Iran. Asian Pac J Cancer Prev. 2016;17(11):4921-27.

[8] Honarmand M, Hajihosseini A, Akbari F. Oral cancer knowledge of senior dental students in Zahedan, South-East of Iran. Asian Pac J Cancer Prev. 2014;15(7):3017-20.

[9] Raji Lahiji M, Dehdari T, Shokouhi Shoormasti R, Hosseini AF, Navaei M, Zarrati M. Nutrition knowledge, attitudes, and practice towards breast cancer prevention among the female population of Iran University of medical science students. Nutr Cancer. 2019;71(8):1355-64.

[10] Althobaiti A, Jradi H. Knowledge, attitude, and perceived barriers regarding colorectal cancer screening practices and risk factors among medical students in Saudi Arabia. BMC Med Educ. 2019;19(1):421.

[11] Hussain I, Majeed A, Rasool MF, Hussain M, Imran I, Ullah M, et al. Knowledge, attitude, preventive practices and perceived barriers to screening about colorectal cancer among university students of newly merged district, Kpk, Pakistan-A cross-sectional study. J Oncol Pharm Pract. 2020:1078155220922598.

[12] Kye SY, Hwang SY, Oh KH, Jun JK. Effects of a cancer prevention education program on elementary school students' knowledge, attitude, self-efficacy, and intentions in South Korea. Epidemiol Health. 2019;41:e2019027.

[13] Dolatkhah R, Somi MH, Shabanloei R, Farassati F, Fakhari A, Dastgiri S. Main Risk Factors Association with Proto-Oncogene Mutations in Colorectal Cancer. Asian Pac J Cancer Prev. 2018;19(8):2183-90.

[14] Coban A, Kavlak O, Ozbasaran F. The evaluation of school of health students' knowledge and behaviour of healthy life-styles of related to importance to prevent cancer. Asian Pac J Cancer Prev. 2010;11(3):773-76.
[15] Hudson L, Samons KM, Dicken HE, Prichard C, Weiss LT, Edward J, et al. A Brief educational intervention enhances basic cancer literacy among Kentucky middle and high school students. J Cancer Educ. 2020.
[16] Herek TA, Branick C, Pawloski RW, Soper K, Bronner LP, Pocwierz-Gaines MS, et al. Cancer biology and you: an interactive learning event for native american high school students to increase their understanding of cancer causes, prevention, and treatment, and to foster an interest in cancer-related careers. J STEM Outreach. 2019;2(1).
[17] Khani Jeihooni A, Moradi M. The effect of educational intervention based on PRECEDE model on promoting skin cancer preventive behaviours in high school students. J Cancer Educ. 2019;34(4):796-802.
[18] Rangey PS, Sheth MS, Khan A. Awareness about effects of tobacco and areca-nut use in school children of Ahmedabad, India: A cross-sectional questionnaire-based survey. Tob Prev Cessat. 2018;4:34.
[19] Zakeri Darbaghi M, Mazloomy Mahmoodabad SS, Mohseni S, Purdakan J, Bakhsh Kurd A, Sohrabi M. The effect of education prevention of cancer on student's knowledge attitude and practice in hashtbandi city. Journal of Preventive Medicine. 2017;4(1):59-65.
[20] Zolfaghari M, Parsa-yekta Z, Behramnezhad F, Kazemnejad A, Monjamed Z. Awareness of Tehran residents of seven warning signs of cancer, and application of protective measures against cancer. Basic Clin Cancer Res. 2013;5(3):28-35.
[21] Karayurt O, Ozmen D, Cetinkaya AC. Awareness of breast cancer risk factors and practice of breast self examination among high school students in Turkey. BMC Public Health. 2008;8:359.
[22] Milaat WA. Knowledge of secondary-school female students on breast cancer and breast self-examination in Jeddah, Saudi Arabia. East Mediterr Health J. 2000;6(2-3):338-44.
[23] Ma F, Collado-Mesa F, Hu S, Kirsner RS. Skin cancer awareness and sun protection behaviours in white Hispanic and white non-Hispanic high school students in Miami, Florida. Arch Dermatol. 2007;143(8):983-88.
[24] Hall HI, Jones SE, Saraiya M. Prevalence and correlates of sunscreen use among US high school students. J Sch Health. 2001;71(9):453-57.
[25] Al-Amoudi S, AlHomied MTA, AlSayegh NYN, Radi ONI, Zagzoog MMS, Aloufi OFM, et al. Breast cancer knowledge among male high school students in Saudi Arabia. J Cancer Educ. 2016;31(4):784-88.
[26] Janjani H, Nedjat S, MasoudYunesian, Nasseri S, Haghighat Doost F, Nabizadeh R. Sun exposure and health safety practices of high school students in an urban population of Iran. BMC Public Health. 2019;19(1):1736.
[27] Nedjat S, Bore M, Majdzadeh R, Rashidian A, Munro D, Powis D, et al. Comparing the cognitive, personality and moral characteristics of high school and graduate medical entrants to the Tehran University of Medical Sciences in Iran. Med Teach. 2013;35(12):e1632-37.
[28] Salari N, Farokhzadian J, Abazari F. Comparing health promotion behaviours of male and female high school students in Southeast of Iran. Int J Adolesc Med Health. 2017;32(1).
[29] Maseudi GR, Hosseini EO, Mirzaei R, Shahrakipour M, Hosseini SA. The effects of education based on protection motivation theory on the harmful effects of solar rays on male students. Iranian Journal of Health Education and Health Promotion. 2015;2(4):322-30.
[30] Sumen A, Oncel S. Effect of skin cancer training provided to maritime high school students on their knowledge and behaviour. Asian Pac J Cancer Prev. 2015;16(17):7769-79.
[31] Ugwumba FO, Ekwueme OE, Okoh AD. Testicular cancer and testicular self-examination; Knowledge, attitudes and practice in final year medical students in Nigeria. Asian Pac J Cancer Prev. 2016;17(11):4999-5003.
[32] Marin S, Allahverdipour H, Hajizadeh M, Fakhari A, Ansari H, Mohammadpoorasl A. Changes in risk-taking behaviours during the first year of college in the northwestern Iran: A latent transition analysis. J Res Health Sci. 2019;19(4):e00460.
[33] Marin S, Heshmatian E, Nadrian H, Fakhari A, Mohammadpoorasl A. Associations between optimism, tobacco smoking and substance abuse among Iranian high school students. Health Promot Perspect. 2019;9(4):279-84.
[34] Huong NT, Kien NT, Giang KB, Minh HV, Hai PT, Huyen DT, et al. Knowledge and attitude towards tobacco smoking among 13-15 year-old school children in Vietnam-findings from GYTS 2014. Asian Pac J Cancer Prev. 2016;17(S1):37-42.
[35] Adamowicz K, Zalewska M, Majkowicz M, Zaucha JM. Evaluation of the impact of different types of health education on the adoption and preservation of prohealth attitudes in preventing cancer in Juveniles younger than 18 years. J Cancer Educ. 2015;30(3):432-38.
[36] Odukoya OO, Odeyemi KA, Oyeyemi AS, Upadhyay RP. Determinants of smoking initiation and susceptibility to future smoking among school-going adolescents in Lagos State, Nigeria. Asian Pac J Cancer Prev. 2013;14(3):1747-53.

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