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The Awareness of Cancer and Attitudes among Turkish Adolescents

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ABSTRACT Cancer awareness among adolescents has a critical role in future cancer prevalence, therapy and early diagnosis. The aim of the study was to determine the knowledge level of adolescents about cancer and it's symptoms. The 9-12th class students of two high schools were involved in the study. After getting informed consent 1311 students were asked to answer a questionnaire form. The mean age was 16.3 ± 1.12. The cases were grouped as Group 1 (adolescents without family members with cancer) and Group 2 (the cases that had family members with cancer). The awareness rates for all of nine common cancer signs were significantly higher in adolescents that had family members with cancer. The presence of a family member with cancer increased the rates of being aware but the increased awareness in that group did not change the attitudes towards possible presence of cancer symptoms.

INTRODUCTION

Adolescence can be described as a transition period from childhood to adulthood (Raphael 2013). Certain psychosocial changes occur along with changes in body shape. The child develops attitudes related to his/her own health. The knowledge related to healthy eating habits, exercising, and addictive substances are all potential factors that may in the future affect the adulthood life. Health related behaviors are stabilized during the adolescence period as stated by Sawyer et al. (2012). School-based brief psycho-educational interventions are successful to increase awareness of cancers symptoms among adolescents which are easy to implement (Hubbard et al. 2015). There are studies showing that the adolescents who exhibit risky behaviors continue to exhibit them during adulthood (Koivusilta et al. 2003). Implementations to have positive effects and preventing risky habits must be done during adolescence. To increase the knowledge of future population; the adolescent period must be on target for awareness of cancer symptoms and cancer prevention. Also the psycho-social aspects of the condition have to be taken into account. The adolescents have problems unique to this period during development of self-concept, and social comparison. These all may affect the understanding of adolescent about the disease and protection ways. The adolescent faces difficulties in relation to the characteristics of the developmental period they have. Cancer also has its own burdens which causes emotional suffering.

The general cancer sign and symptoms are; unexplained weight loss, fever, fatigue, pain, skin changes, changes in bowel and urinary function, sores that do not heal, oral ulcers, unusual bleeding or discharge, thickening or lump in the breast or other parts of the body, indigestion or trouble in swallowing, recent change in a wart or mole or new skin change, nagging cough or hoarseness ("Signs and Symptoms of Cancer," n.d.).

Unexplained weight loss usually occurs in pancreatic, gastric, and esophagus cancers. Fever may happen during the course of any cancer, especially if it has spread to other organs or during infections occurred during the therapy

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phase. Also leukemias and lymphomas may cause fever at the very early stages. Pain can be seen in all cancers, but may be an early sign of bone cancers and testicular cancers. Skin changes including; hyper-pigmentation, jaundice, erythema, pruritus, and regional hypertricosis may be seen during the course of illnesses. Also skin cancers and melanomas may be detected from the dermal examination. Long term constipation may happen in case of colorectal cancers. Dysuria or hematuria may be signs of bladder or prostate cancer ("Signs and Symptoms of Cancer," n.d.) . Knowing the presence of all these symptoms may help the adolescent to recognize possibility of cancer and save his/her and families health.

Recognition of these signs and symptoms are particularly important for adolescents. Both adolescent cancers and parental cancers of adolescents may be a disaster for the youngster. The cancer detected in the patient will have deep effect in the family, particularly in the children and the spouse. The children will face psychosocial problems and probably develop anxiety, sadness, anger, and hopelessness. The routine daily life will be seriously affected. Many hospital admissions, frequent doctor visits, emergencies that occur, fear of losing the beloved family member will all have capacity to ruin the life of the adolescent. School aged children had; according to some reports, fear of cancer symptoms, side effects, fear of losing the parent, feeling of guilt since they thought they were responsible for the occurrence of the disease (Visser et al. 2004). The education has been also influenced by the presence of a family member with cancer. A diminished performance in school and lowered attendance rates have been reported in adolescents (Nelson et al. 1994).

Age standardized incidence rate of childhood cancer from birth to 19 years of age was 132.1 per million person-years; in a study conducted in Taiwan (Hung et al. 2014). The need of increasing the knowledge of adolescents is a worldwide problem. There are reports that address the intense learning needs shared by adolescents worldwide. In a study enrolled adolescent girls in Colombo, Sri Lanka; awareness of breast cancer was evaluated (Ranasinghe et al. 2013). Among the girls 17.1 percent knew performing breast examination and 9.4 percent were aware of screening services. Adolescence cancer types differ from adulthood. In early adolescence the leukemias and central nervous system tumors predominate. Mid and late-term adolescents have lymphomas as the predominating tumor type (Lewis 1996).

The presence of a member in the family with cancer will make the adolescent to face these problems and will probably cause the development of psychological problems. This will make the adolescent to increase the knowledge about cancer and its risk factors together with cancer symptoms. Cancer awareness among adolescents has a critical role in future cancer prevalence and therapy, since it has potential to effect protection and early diagnosis. Cancer detection at the very early stages necessitates increasing knowledge about symptoms that may happen in case of various cancer types. Having knowledge about cancer symptoms may cause avoiding cancer risks and developing positive behaviors. Increasing cancer awareness in adolescents will cause adolescents to seek for knowledge and adopt logical behavioural patterns. This will include development of positive health related behaviour and health seeking behaviour (Kyle et al. 2013).

Objective

In this paper the researchers aimed to determine the awareness of Turkish adolescents about cancer symptoms and attitudes towards potential presence of these symptoms. Also effect of presence of a family member with cancer on attitudes was investigated.

METHODOLOGY

The aim of the study was to determine the knowledge level of adolescents about cancer and symptoms of it. The 9-12th class students of two high schools were involved in the study. The study was conducted in the year of 2015 and after getting informed consent, 1311 students were asked to answer the questionnaire form. The researchers also gathered information related to socio-demographic characteristics. The presence of cancer or other chronic diseases among family members were also investigated. The educational and socio-economic statuses of the parents were also in focus. The researchers also asked about regular use of medications due to any chronic disease. Previous fatalities in family members or relatives were recorded. Smoking status was noted. The knowledge level related to cancer symptoms was determined, by describing the symptom in each

item and by asking the student if he/she knew that it was related to cancer. The researchers asked the way adolescents acted if those symptoms occurred. Also presence of a patient in the family was used for comparative analysis. The cases were grouped into two; according to having a family member, with cancer or not. Group 1 consisted of adolescents without family members with cancer. Group 2 were the cases that had family members with cancer. SPSS 21.0 software programme was used for statistical analysis. The data were presented as mean and percentages. Pearson ki-square, Yates ki-square tests were used in the statistical analysis. A p value < 0.05 designated statistical significance. Informed consents were taken from all participants. The review board of Uludag University and the National Education Directorate of city of Bursa approved the study for human subjects.

RESULTS

The demographic characteristics are given in Table 1. The table reveals that majority of the students live with families and the study group has even distribution of gender. The mean age was 16.3 ± 1.12. Majority of the adolescents were under cover of social security system. The educational levels of fathers were higher with a high school or university degree of 48.1 percent, compared to 31.6 percent in woman. Among the symptoms; the mostly known to be related to cancer was "palpable swelling in the breast or other organs" (n=810, 62.2%). The least known symptoms were "changes in bowel and urinary habits" (n=274, 21.0%) and "difficulty in swallowing, or indigestion" (n=285, 21.9%) (Fig. 1). This may in turn be the cause of late diagnosis and frequent metastasis, seen in gastrointestinal cancers. As we can see in Figure 1, the awareness rates are unsatisfactory in that age group. During the interview the researchers realized that the pain was the most effective symptom for all cases to consult the family.

In the Table 2 the distribution of the symptoms awareness according to groups are given. The awareness rates for all of nine common can-

Table 1: Socio-demographic data of the study group

		n	*%*
Age	14	34	2.6
	15	325	24.8
	16	358	27.3
	17	386	29.4
	18	186	14.2
	19 +	22	1.7
Gender	Female	678	51.2
	Male	633	47.8
Accommodation	House	1149	87.6
	Dormitory	162	12.4

		Mother		*Father*	
		n	*%*	*n*	*%*
Educational Level	Illiterate	36	*2.7*	7	0.5
	Literate	30	*2.3*	20	1.5
	Primary school	480	*36.6*	311	23.7
	Secondary school	336	*25.6*	325	24.8
	High school	329	*25.1*	442	33.7
	University degree	86	*6.5*	188	14.4

Questions related to health	*Yes*		*No*	
. socioeconomic status and family	*n*	*%*	*n*	*%*
Known health problem of adolescent	205	15.6	1106	84.4
Regular medication of adolescent	93	7.1	1218	92.9
Family member with chronic disease	208	15.9	1103	84.1
Family member with cancer	79	6	1232	94
Smoking status of adolescent	172	13.1	1139	86.9

Table 2: Awareness rates compared between groups

I think that the following symptom is a sign of cancer						
Cancer signs	*Group 1*		*Group 2*			*p*
	n	*%*	*n*	*%*		
Changes in bowel and urinary habits	249	20.3	25	31.6	5.709	p=0.017
Long-lasting. non-healing wounds	588	48.1	46	58.2	3.060	p=0.08
Unexpected bleeding and drainage	562	45.9	47	59.5	5.497	p=0.019
Palpable swelling in the breast or other organs	750	61.3	60	75.9	6.795	p=0.009
Difficulty in swallowing. or indigestion	254	20.8	31	39.2	14.84	p=0.00
Fever of unknown origin. weight loss	631	51.6	54	68.4	8.361	p=0.004
Significant changes in warts and nevi	378	30.09	33	41.8	4.076	p=0.044
Prolonged hoarseness and cough	328	26.8	37	46.8	14.776	p=0.00
Pain	528	43.1	26	32.9	3.175	p=0.075

cer signs were significantly higher in adolescents that had family members with cancer, except for long-lasting, non-healing wounds. The family member that had cancer might have the listed signs that had been witnessed by the adolescent. Another explanation may be the increased learning needs by the adolescent that caused a seeking for knowledge. The gender affects can be examined in Table 3. Interestingly gender had no effect on awareness rates of the adolescents for cancer signs. At least researchers expected to have the palpable swelling in the breast, a better known sign among girls compared to boys. However the sign had in fact higher rates of recognition by the adolescents.

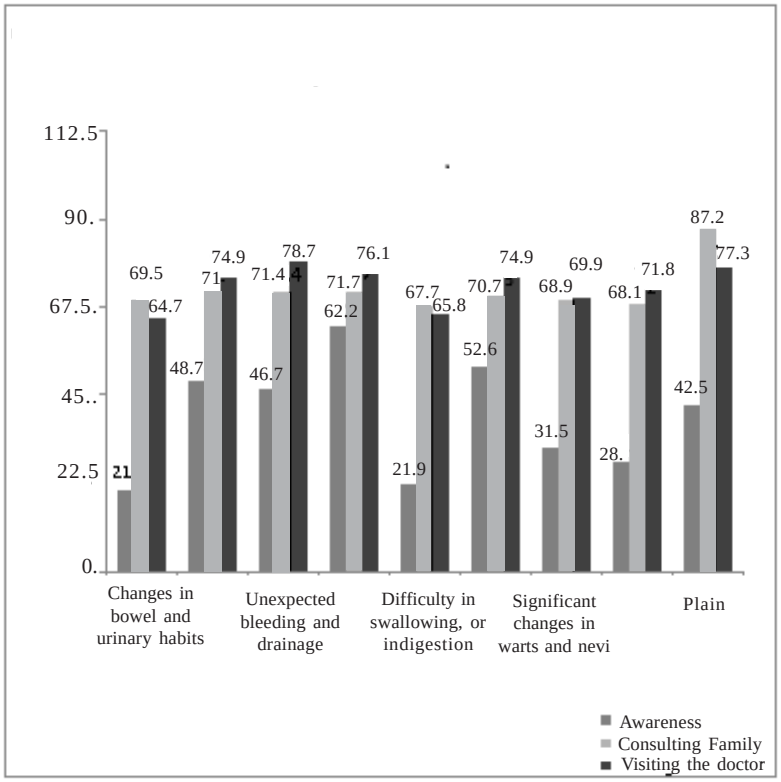

Fig. 1. The awareness rates of adolescents for the nine common cancer symptoms. The data are given as percentages

Table 3: Awareness rates of cases according to gender

I think that the following symptom is a sign of cancer											
Cancer signs	*Group 1*						*Group 2*				
	Male		*Female*				*Male*		*Female*		
	n	*%*	*n*	*%*		*p*	*n*	*%*	*n*	*%*	*p*
Changes in bowel and urinary habits	133	22.4	116	18.4		p>0.05	11	31.4	14	31.8	p>0.05
Long-lasting. non-healing wounds	303	51.1	285	45.2	4.2	p=0.04	19	54.3	27	61.4	p>0.05
Unexpected bleeding and drainage	278	46.9	284	45		p>0.05	20	57.1	27	61.4	p>0.05
Palpable swelling in the breast or other organs	387	65.3	363	57.5	7.71	p=0.006	25	71.4	35	79.5	p>0.05
Difficulty in swallowing. or indigestion	136	22.9	118	18.7		p>0.05	14	40	17	38.6	p>0.05
Fever of unknown origin. weight loss	315	53.2	316	50.1		p>0.05	23	65.7	31	70.5	p>0.05
Significant changes in warts and nevi	185	31.2	193	30.6		p>0.05	14	40	19	43.2	p>0.05
Prolonged hoarseness and cough	176	29. 7	152	24. 1	4.87	p=0.027	14	40	23	52. 3	p>0.05
Pain	241	40.6	287	45.5		p>0.05	10	28.6	16	36.4	p>0.05

The adolescents preferred to consult the family for the cancer signs at a rate of 67.5-71.7 percent for the given symptoms. Rate of preferring to visit the doctor for the symptoms ranged from 64.7-78.7 percent. In Table 4, the preferences of the adolescents in case of potential presence of each of these symptoms, according to having a family member with cancer are given. The groups were indifferent in their way of acting for presence of each cancer symptoms. In a way the presence of a family member with cancer did not cause a change in the proposed way of action which included consulting the family and visiting the doctor in case of presence of these signs.

DISCUSSION

The attitudes and knowledge of adolescents about cancer has been evaluated in different populations. The awareness rates of cancer symptoms in this study for all participants are low (Fig. 1) as the researchers expected, due to the low awareness rates reported worldwide. A study conducted in Indian woman showed that knowledge about breast cancer was very low with no relation to socio-economic and educational status (Gupta et al. 2015). An article by Al-Naggar determined the knowledge levels and beliefs of Malaysian adolescents. They stated that Malaysian adolescents had a moderate level of knowledge about cancer (Al-Naggar et al. 2015). In the study of Kyle, conducted in Britain about adolescents' cancer awareness and help-seeking behavior that included 478 adolescents aged 11-17 years old; said that half of adolescents did not know the most common childhood (51%) or teenage (49%) cancers (Kyle et al. 2013). In a study conducted in England in an adult population; the cases had recognized 7.2 of 9 common cancer symptoms on average (Niksic et al., 2015). These rates of awareness are tremendously high compared to this study's results addressing the age impact. This is in a way supported by the findings of Kyle et al. who stated that as the adolescents age increased awareness of cancer symptoms significantly increased (Kyle et al. 2013).

Adolescence is very valuable for providing opportunities to implement measures to affect adulthood health. Not to miss that period for the current generation, programs focused on determining level of knowledge that is followed by interventional programs for adolescents. Also socioeconomic factors for each community should have to be taken into consideration. Gender, ethnicity, place of living also affects the awareness status and barriers for medical seek. In the study of Niksic et al. it was reported that the youngest, the oldest, the single and participants with the lowest socio-economic status recognised the fewest cancer symptoms, and reported most barriers to presentation (Niksic et al. 2015). According to their study, women were more likely recognise each cancer symptom, except "persistent unexplained pain". The gender affects were also included for the awareness of common cancer symptoms in this analysis. In group 2 the gender had no affect at all for recognition of cancer symptoms (Table 3). In Group 1

Table 4: Preferences of adolescents in case of possible presence of common cancer signs

Cancer signs	*I consult with my family*									*I visit the doctor*									
	Group 1				*Group 2*					*Group 1*				*Group 2*					
	Yes		*No*		*Yes*		*No*			*Yes*		*No*		*Yes*		*No*			
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*p*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*p*
Changes in bowel and urinary habits	857	70.1	366	29.9	54	68.4	25	31.6	p>0.05	797	65.3	424	34.7	44	55.7	35	44.3	p>0.05
Long-lasting, non-healing wounds	868	71.0	355	29.0	57	72.2	22	27.8	p>0.05	918	75.1	304	24.9	57	72.2	22	27.8	p>0.05
Unexpected bleeding and drainage	873	71.4	350	28.6	56	70.9	23	29.1	p>0.05	967	79.1	255	20.9	57	72.2	22	27.8	p>0.05
Palpable swelling in the breast or other organs	875	71.5	348	28.5	58	73.4	21	26.6	p>0.05	931	76.2	291	23.8	58	74.4	20	25.6	p>0.05
Difficulty in swallowing, or indigestion	830	67.9	393	32.1	51	64.6	28	35.4	p>0.05	810	66.3	411	33.7	46	58.2	33	41.8	p>0.05
Fever of unknown origin. weight loss	857	70.1	365	29.9	57	70.1	22	27.8	p>0.05	918	75.2	303	24.8	56	70.9	23	29.1	p>0.05
Significant changes in warts and nevi	849	69.4	374	30.6	48	60.8	31	39.2	p>0.05	862	70.5	360	29.5	48	60.8	31	39.2	p>0.05
Prolonged hoarseness and cough	841	68.8	382	31.2	46	58.2	33	41.8	p>0.05	876	71.7	345	28.3	54	68.4	25	31.6	p>0.05
Pain	1066	87.1	158	12.9	71	89.9	8	10.1	p>0.05	947	77.4	277	22.6	61	77.2	18	22.8	p>0.05

"long-lasting, non-healing wounds", "Palpable swelling in the breast or other organs", and "Prolonged hoarseness and cough" were recognised more commonly in boys, in a statistically significant manner.

During adolescence sexual behaviours shape and certain risks occur. The adolescence is highly important for prevention of future human papilloma virus infection and hence cervix cancer. Level of understanding of parents and the adolescents have critical role for prevention of the disease by vaccination. In a study by Marek et al. a survey was done 3 years after introduction of HPV vaccine in Hungary (Marek et al. 2011). In their study they evaluated the awareness of human papilloma virus infection and attitudes towards vaccination for it. In their study only 35 percent of adolescents stated that they had heard about HPV prior to the study they were enrolled. Seventy percent of the potentially effected study population had heard about the vaccine previously. A study similarly focused Malaysian adolescents for evaluation of cervical cancer knowledge and acceptance of HPV vaccination (Rashwan et al. 2011). The study showed that majority (61.8%) of the students had poor level of knowledge about cervical cancer and its prevention. In the study by Özyer et al. among Turkish female adolescents and young woman, the awareness of Human Papilloma virus was around 41 percent (Özyer et al. 2013). In another study 43.5 percent of Turkish adolescent girls wished to be vaccinated against HPV. For mothers and fathers, the rate of preferring their daughters to be vaccinated against Human Papilloma virus was 45.5 percent and 44.9 percent; respectively (Kiliç et al. 2012).

In order to increase knowledge levels some programs may be planned and implemented. The success of these kinds of acts has been reported before. Increasing public awareness of symptoms of cancer was accomplished by "Be Clear on Cancer Campaign" in England (Power and Wardle 2015). With this campaign rate of recognition of persistent cough or hoarseness and change in bowel/bladder habits as a sign of cancer significantly increased. Interestingly barriers to visiting the general practitioner were not reduced, indicating necessity of a different approach for this problem. Since the thought of having probability of cancer is a stressful thing and the alarming nature of the condition has

deep psychological aspects. Avoidance to see the doctor needs special attention. Many people probably even do not want to think about cancer. Increasing awareness, being informed about the risks more frequently will provide subsiding of the negative thoughts and irrational avoidance behaviours from medical staff.

In this study the researchers also investigated attitudes of adolescents towards cancer. Agreement with the possibilities of visiting the doctor and consulting the family did not differ between group 1 and group 2 (Table 4). Increased awareness in group 2 didn't lead to a change in the way of acting in case of possible presence of symptoms. Then there comes the barriers for medical seeking behaviour in case of presence of cancer. In the study of Kyle et al. only 74 percent of adolescents would seek help for a symptom that may be related to cancer within 3 days (Kyle et al. 2013). This is in accordance to this study which revealed that more than 20 percent of adolescents would not see a doctor in case of presence of cancer symptoms. The researchers didn't ask the reasons for their act, but study of Kyle et al. found some explanations. According to Kyle et al. the most endorsed barriers to help-seeking were 'worry about what the doctor might find' (72%), being 'too embarrassed' (56%), 'too scared' (54%) and 'not feeling confident to talk about symptoms' (53%). Endorsement of these emotional barriers was significantly higher among females (pd"0.001) (Kyle et al. 2013). In their study also knowing someone with cancer significantly increased the awareness of symptoms. This is also in accordance to the results of this study that revealed increased awareness of cancer symptoms in adolescents having a family member or a relative with now or before (group 2) (Table 2). Also, a recent study conducted in Scotland among adolescents showed that knowing someone with cancer was a significant independent predictor of recognising more cancer warning signs. In that study a Black and Minority Ethnic status significantly and independently predicted recognising fewer cancer warning signs (Hubbard et al. 2014).

Knowledge about cancer helps to develop positive behaviours like avoiding cigars, excessive sun exposure, and unhealthy eating habits. Over exposure to sun radiation during childhood is an important aspect of skin cancer risk. In a study conducted in Greece coastal areas, the sun burn incidence was high in adolescents and the younger pupils (41.9% vs. 55.6%). In the study, those with better knowledge had the fewer sun burns (Saridi et al. 2015). Training to increase the knowledge about cancer signs has been reported to be effective. Balyaci et al. in their study conducted in Turkey among 6-8th class students after training for skin cancer symptoms and self-examination, stated that knowledge level about skin cancer had increased and the behaviour of performing skin self-examination improved (Balyaci et al. 2012).

CONCLUSION

In this study awareness of cancer symptoms among adolescents was lower than desired. The presence of a family member with cancer increased the rates of being aware. However the increased awareness in that group did not change the attitudes towards possible presence of cancer symptoms.

RECOMMENDATIONS

Campaigns about cancer prevention targeting adolescents will probably increase the level of knowledge. Interventional studies, involving both adolescents and the parents will be more helpful to cope with the difficulties of cancer, since the disease never affects only the patient; but the whole family and the surrounding.

REFERENCES

Al-Naggar RA, Jillson IA, Abu-Hamad S, Mumford W, Bobryshev YV 2015. Knowledge and beliefs of Malaysian adolescents regarding cancer. *Asian Pacific Journal of Cancer Prevention/ (APJCP),* 16(3): 1097–1103.

Balyaci OE, Kostu N, Temel AB 2012. Training program to raise consciousness among adolescents for protection against skin cancer through performance of skin self-examination. *Asian Pacific Journal of Cancer Prevention (APJCP),* 13(10): 5011–5117.

Gupta A, Shridhar K, Dhillon PK 2015. A review of breast cancer awareness among women in India: Cancer literate or awareness deficit? *European Journal of Cancer,* 51(14): 2058–2066.

Hubbard G, Macmillan I, Canny A, Forbat L, Neal RD, O'Carroll RE, Haw S, Kyle RG 2014. Cancer symptom awareness and barriers to medical help seeking in Scottish adolescents: A cross-sectional study. *BMC Public Health,* 14(1): 1117.

Hubbard G, Stoddart I, Forbat L, Neal RD, O'Carroll RE, Haw S, Rauchhaus P, Kyle RG 2015. School-based brief psycho-educational intervention to raise

adolescent cancer awareness and address barriers to medical help-seeking about cancer: A cluster randomised controlled trial. *Psycho-Oncology*, doi:10.1002/pon.4001.

Hung GY, Horng JL, Lee YS, Yen HJ, Chen CC, Lee CY 2014. Cancer incidence patterns among children and adolescents in Taiwan from 1995 to 2009: A population-based study. *Cancer,* 120(22): 3545–3553.

Kilic A, Seven M, Guvenc G, Akyuz A, Ciftci S 2012. Acceptance of human Papillomavirus vaccine by adolescent girls and their parents in Turkey. *Asian Pacific Journal of Cancer Prevention (APJCP),* 13(9): 4267–4272.

Koivusilta L, Rimpelä A, Vikat A 2003. Health behaviour and health in adolescence as predictors of educational level in adulthood: A follow-up study from Finland. *Social Science and Medicine,* 57(4): 577–593.

Kyle RG, Forbat L, Hubbard G 2013. Cancer awareness among adolescents in Britain: A cross-sectional study. *BMC Public Health,* 12: 580. doi:10.1186/1471-2458-12-580.

Kyle RG, Macmillan I, Rauchhaus P, O'Carroll R, Neal RD, Forbat L, Haw S, Hubbard G 2013. Adolescent Cancer Education (ACE) to increase adolescent and parent cancer awareness and communication: Study protocol for a cluster randomised controlled trial. *Trials,* 14: 286.

Lewis IJ1996. Cancer in adolescence. *British Medical Bulletin,* 52(4): 887–897.

Marek E, Dergez T, Rebek-Nagy G, Kricskovics A, Kovacs K, Bozsa S, Kiss I, Ember I, Gocze P 2011. Adolescents' awareness of HPV infections and attitudes towards HPV vaccination 3 years following the introduction of the HPV vaccine in Hungary. *Vaccine,* 29(47): 8591–8598.

Nelson E, Sloper P, Charlton A, While D 1994. Children who have a parent with cancer: A pilot study. *Journal of Cancer Education,* 9(1): 30-36.

Niksic M, Rachet B, Warburton FG, Wardle J, Ramirez AJ, Forbes LJ 2015. Cancer symptom awareness and barriers to symptomatic presentation in England-Are we clear on cancer? *British Journal of Cancer,* 113(3): 533-542.

Ozyer S, Uzunlar O, Ozler S, Kaymak O, Baser E, Gungor T, Mollamahmutoglu L 2013. Awareness of Turkish female adolescents and young women about HPV and their attitudes towards HPV vaccination. *Asian Pacific Journal of Cancer Prevention (APJCP),* 14(8): 4877-4881.

Power E, Wardle J 2015. Change in public awareness of symptoms and perceived barriers to seeing a doctor following be clear on cancer campaigns in England. *British Journal of Cancer,* 112(Suppl): S22–26.

Ranasinghe HM, Ranasinghe N, Rodrigo C, Seneviratne Rde A, Rajapakse S 2013. Awareness of breast cancer among adolescent girls in Colombo, Sri Lanka: A school based study. *BMC Public Health,* 13(1): 1209.

Raphael D 2013. Adolescence as a gateway to adult health outcomes. *Maturitas,* 75(2): 137–141.

Rashwan H, Lubis SH, Ni KA 2011. Knowledge of cervical cancer and acceptance of HPV vaccination among secondary school students in Sarawak, Malaysia. *Asian Pacific Journal of Cancer Prevention,* 12(7): 1837–1841.

Saridi MI, Toska AG, Rekleiti MD, Tsironi M, Geitona M, Souliotis K 2015. Sun burn incidence and knowledge of Greek elementary and high school children about sun protection. *Asian Pacific Journal of Cancer Prevention/ (APJCP),* 16(4): 1529–1534.

Sawyer SM, Afifi RA, Bearinger LH, Blakemore SJ, Dick B, Ezeh AC, Patton GC 2012. Adolescence: A foundation for future health. *Lancet* 379 (9826): 1630–1640.

Signs and Symptoms of Cancer 2015. From <http://www.cancer.org/cancer/cancerbasics/signs-and-symptoms-of-cancer.> (Retrieved on 12 September 2015).

Visser A, Huizinga GA, van der Graaf WT, Hoekstra HJ, Hoekstra-Weebers JE 2004. The impact of parental cancer on children and the family: A review of the literature. *Cancer Treatment Reviews,* 30(8): 683–694.

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