Epidemiological study of prevalence of pediculosis and its related factors using the health belief model in elementary school students in Khorramshahr city of Iran

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ABSTRACT

This study aimed to determine the prevalence of pediculosis and its related factors in elementary students in the city of Khorramshahr. A cross-sectional, descriptive-analytic that carried out on 170 female students in Khorramshahr city on March and April of 2015. 22 subjects (12.9%) got infestation of head lice in the past three months and 148 (87.1%) could not experienced infestation of louse. The mean score of awareness between the studied sample was 48.41 ± 3.12 with maximum value 36 and minimum value 4. Regression analysis was used to predict behaviours. Results showed that only the awareness variable was behaviour predictive (p = 0.014). There was no significant relationship between predictive behaviours and demographic variables. The results of this study showed that the knowledge is the only predictive variable of behaviour that has significantly relationship with preventive behaviour of pediculosis. As a result, elementary school students can be protected by increasing awareness of preventive behaviours and the prevalence of pediculosis can be reduced.

Key words : Iran, Health, Lice Infestations, Students.

INTRODUCTION

Regarding the importance of public health in the remarkable progress of any society, it can be acknowledged that this issue constitutes of topics can be viewed in any society and we also see nowadays, in spite of the progress of medical science and health promotion, there are still threatening public health such as insects, particularly external parasites to infestation as a health problem (Bahmanpour *et al.*, 2011). One of this type of infestation is head lice, the most common kind of louse in humans, and is frequent in the world including Iran with the prevalence of 6 - 30%. It should be noted that head lice in the environment with high population density, poverty, and lack of individual health is more common (Zareban *et al.*, 2006; Sidoti *et al.*, 2009 and Noroozi et al., 2013). However, it cannot be claimed that head lice are only related to third world countries (Shahraki *et al.*, 2001), because the results of the study of Marshall et al. 2013 in the United States reported the fact of selling more than 240 million insecticide toxins, infestation rate of 6 to 12 million subjects, 6.2 million households affected by infestation of lice and ultimately cost estimates of 11 billion dollars to control of this health problem (Clark *et al.*, 2013).

It should be noted that the main way of transition of head lice is through close contact with head to head, of course, in some references have noted the role of the common instruments, such as the use of underwear, towels, hats, scarves and combs (CDC, 2014 and Moradi *et al.*, 2012). In pediculosis disease, lice suck the person's blood daily in several times, and insert themselves saliva into the person's body. Then toxic effects may cause some symptoms such

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as fatigue, nerve stimulation, depression, insomnia and educational drop that in severe cases cause a secondary infection and itching, pessimistic mode and the feeling of indolence in person (Shahraki *et al.*, 2001; Clark *et al.*, 2017; CDC, 2014; Moradi *et al.*, 2012 and Speare, 2003).

Infestation of lice is as a social issue that has involved many societies and is one of the health rampant problems (Hosseini *et al.*, 2014). This infestation causes psychological frustrations because of the social stigma related to shame, anger and embarrassment of lice infestation in children and their families. Reactions are different depending on the reaction of the community along with the infested children, separation of children with blaming and making the effort (guidelines) for the eradication of severe infestation and precision in the treatment (Mumcuoglu *et al.*, 2006 and Bachok *et al.*, 2006).

With regard to the direct transmission of head lice from person to person, schools due to the population density are the best place to expand and stabilize this parasite on the society and according to studies on contamination of head lice , the most prevalence is seen in ages between 6-11 years old in schools (Chouela *et al.*, 1997). Then, the research community was selected in schools, because schools also have high potential for infestation and most appropriate location to provide health education and prevention and control of head lice infestation. It is very important that people know that head lice infestation are preventable through health education, and getting rid of it is very simple (Vahabi *et al.*, 2013; Mohammad-nejad, 2001; Gholamnia *et al.*, 2011 and Motavali-Emami *et al.*, 2008).

So the basic measures to combat the insect are the promotion of awareness level of students, parents and school officials about the lice, improving preventive behaviors such as regular bathing, combing hair daily, non-use of someone else classmates instruments (such as combs, brushes, scarves and etc.), regular washing and ironing of school uniforms, at least control of hairs twice the week, report any observed infestation to school officials and the nearest health centers (CDG, 2014 and NHS, 2011).

According to the results of past studies, low awareness of students, parents and school staff in infestation of head lice (Vahabi et al., 2013; G.

Holamnia *et al.*, 2011), as well as increase the spirit of independence in first class undergraduate students from the elementary schools and so reduce parental monitoring on observance of personal hygiene (bathing and washing clothes and hairs, combs and etc.) can prevent the prevention, detection and early treatment of infestation and in other words, will cause the distribution of disease (Chahraki *et al.*, 2001 and Paredess *et al.*, 1997).

So right health behaviors in any society are inevitable, so that students and parents in order to understand and practice the ways of healthy life, stay healthy and avoid diseases, need education about right behaviors and in this context, health education plays a key role (Zareban *et al.*, 2006 and Valizadeh *et al.*, 2016). On the other hand increase the effectiveness of health education interventions depends on the proper use of theories and models (Valizadeh et al., 2016).

The theoretical framework of the study to identify risk factors and prevention is health belief model, which is attempting to focus on health behaviours and attitudes (Lych and Happell, 2008). Health belief model is important and precise pattern to determine the relationship between health beliefs and behaviour (Galnz *et al.*, 2008) which is depends on two issues of the extent of the danger that he would threat individuals and assessment of the amount of the perceived benefits and perceived barriers about health behaviour (Valizadeh *et al.*, 2016 and Ghaderi *et al.*, 2016). This study aimed to determine the prevalence of pediculosis and related factors using the health belief model in elementary students in the city of Khorramshahr in 2015.

MATERIALS AND METHODS

This study was a descriptive and analytic cross-sectional study that carried out on 170 female students in Khorramshahr city on March and April of 2015. After the cooperation of department of education of the city of khorramshahr and especially of the students participating in the study and satisfaction of students' parents, the list of female elementary schools was perceived and 5 schools among 13 schools were selected. In final, according to the proportion of schools' population, 170 students selected. Inclusion criteria included elementary schools students and satisfaction to participate in the study. Exclusion criteria included failure to fulfill the questionnaire correctly and completely. It was

informed about the confidentiality of their individual information as well as the voluntary nature of participating in the study.

In this study, the questionnaire o of the study of Moshki *et al.* was used that Cronbach's alpha in total was obtained 0.77 (Moshki *et al.*, 2014). Cronbach's alpha were estimated 0.86 for awareness, 0.82 for perceived susceptibility, 0.78 for perceived severity, 0.85 perceived barriers, 0.74 for perceived benefits, 0.76 for self-efficacy and 0.78 for behaviour.

The mentioned questionnaire consists of four parts; the first part of the 12 demographic questions such as age, place of birth, parents' occupation and education of parents and the second with 9 questions of awareness about lice, the method of transmission and prevention . The responses were designed to three options including Yes, No and I do not know, for the correct answer (2 scores), for the false answer (zero score) and for I do not (1 score) were considered.

The third part is related to the health belief model structures including perceived susceptibility, perceived severity, perceived barriers, perceived benefits and self-efficacy. Each structure is consists of 5 questions in terms of Likert scale of 5 options (strongly disagree, no idea, agree and strongly agree) and each phrase is assigned a score between 0 and 4. Questions about the structure of Cues to action (or source of information) as well as were measured as frequency and percentage.

The fourth part is related to the predictive behaviour about infestation of pediculosis. The responses were designed to three options including always, sometimes and never, for the always answer (2 scores), for the sometimes answer (1 score) and for never (1 score) were considered. Moreover, in each section, the sum of points obtained in good group (more than 75% of all total score), moderate (50 to 75% of the total score) and weak (less than 50% of the total grade) is classified.

The study protocol was reviewed in ethic committee and approved in the Abadan University of Medical Sciences with code IR.adadanums. rec.1394.14. After collection of data, statistical analysis was performed using SPSS version 20, Chi-square, descriptive statistics such as frequency, mean and standard deviation, and Pearson correlation with multiple linear regression test at a significance level of $P < 0.05$. It should be noted that being a normal distribution of data also was approved by a Kolmogorov- Simonov test.

RESULTS AND DISCUSSION

The study carried out on 170 students of elementary school in Khorramshahr city. The mean age of students with minimum and maximum ages (13 and 6 years old) was 9.43 years. In this study the mean number of family with minimum and maximum (3 and 13 subjects) was 6 subjects which 63 students (37.1%) were the first sibling and father's occupation of 22 students (12.9%) was employee, 30 students (17.6%), worker, 16 students (9.4%), self-employed, 2 students (1.2%), teacher, 3 students (1.8%) farmer, and 37 students (21.8%) unemployed. 60 students (35.3%)declared that their father have another occupation beyond mentioned occupations. Mother's occupation of 2 students (1.2%) was employee, 1 student (0.6%), worker, 2 students (1.2%), self-employed, 4 students (2.4%), teacher, and 152 students (%89.4%) housekeeper. 9 students (5.3%) declared that their mother had another occupation beyond mentioned occupations. (Table 1).

Among the studied sample, the most announced bathroom were 3 times a week that 70 students (41.2%) went to bathroom 3 times a week and 3 students (1.8%) went every day of the week. Moreover, it is found that the highest and lowest hair combing were 10 and 1, respectively. The mean of hair combing was 3 times a day. In the studied sample a total of 22 students (12.9%) infested in the past three months to head lice and 148 students (87.1%) had not infestation and also 20

Table 1. Frequency distribution of occupation in students' parent.

Occupation	Mother's occupation		Father's occupation	
	Percent	Number	Percent	Number
Employee	1.2%	2	12.9%	22
Worker	0.6%	1	17.6%	30
Self-Employed	1.2%	3	9.4%	16
Teacher	2.4%	4	1.2%	2
Farmer	–	–	1.8%	3
Housekeeper	89.4%	152	–	–
Unemployed	–	–	21.8%	37
Others	5.3%	9	35.3%	60

Table 2. Frequency distribution of education in students and their infestation.

Education	Reception of education about infestation		Infestation of family member		Infestation of participant	
	Percent	Number	Percent	Number	Percent	Number
Yes	55.3%	94	11.8%	20	12.9%	22
NO	44.7%	76	88.2%	150	87.1%	148

students (11.8%) announced that one of their family members infested with head lice in the past three months. In the field of education, also 94 subjects (55.3%) stated that received education in the field of infestation with louse in the past three months and 76 students (44.7%) expressed that they did not receive any education (Table 2).

The mean score of awareness was 48.41 ± 3.12 with maximum value of 36 and minimum value of 4. The mean score of self-efficacy was 94.02 ± 3.57 with maximum value of 25 and minimum value of 5. The mean score for the rest of the variables listed in Table 3.

The results of Pearson correlation coefficient test showed that excluding the perceived benefits, there was a significant relationship between awareness and health belief structures. All of variables in this relationship had positive direction but perceived barriers had reverse direction (Table 4).

In order to predict the behaviour using the health belief model structures and other variables, regression analysis was used that showed the awareness was predictive variable of behaviour (p = 0.014) with coefficient of 0.202. Only 12.2% of behaviour changes can be predicted by awareness as well as there was

Table 3. Mean and Standard Deviation of Health Belief Model Structures in Students.

Structures	Minimum value	Maximum value	SD	Mean
Awareness	4	36	3.12	14.84
Perceived susceptibility	5	71	5.9	20.65
Perceived severity	5	74	5.88	20.30
Perceived barriers	5	36	4.75	11.50
Perceived benefits	5	48	5.12	18.25
Self-efficacy	5	25	3.57	20.49
Behavior	2	13	1.64	8.49

no significant relationship between pediculosis and demographic variables.

Linear regression was used to investigate the concurrent effect of the health belief model structures on the behaviour, the results showed that only awareness was significant (P = 0.014) and other variables had not significant effect on the behaviour. Moreover, according to R2, only 12% of the independent variable changes can be defined by dependent variable that maybe more factors are involved in this regard. It should be noted that the

Table 4. Pearson correlation between health belief model structures in students.

Structures		Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barriers	Self-efficacy	Behavior
Awareness	P value	0.000	0.006	0.029	0.056	0.001	0.000
	correlation coefficient	0.361	0.211	-0.167	0.147	0.258	0.283
Perceived susceptibility	P value		0.005	0.234	0.013	0.000	0.007
	correlation coefficient		0.213	-0.092	0.190	0.381	0.205
Perceived severity	P Value			0.463	0.000	0.128	0.121
	correlation coefficient			-0.057	0.297	0.117	0.120
Perceived barriers	P value				0.646	0.003	0.064
	correlation coefficient				0.035	-0.224	-0.142
Perceived benefits	P value					0.042	0.214
	correlation coefficient					0.156	0.096
Self-efficacy	P value						0.001
	correlation coefficient						0.247

Table 5. Relationship of health belief model structures using linear regression in students.

Structures	B. coefficient	Results	T. statistics	P value
Constant value	5.11	Significance	5.070	00.00
Perceived severity	0.036	No significance	0.436	0.644
Awareness	0.202	Significance	2.49	0.014
Self-efficacy	0.150	No significance	1.83	0.069
Perceived benefit	0.023	No significance	0.300	0.765
Perceived barrier	-0.069	No significance	-0.899	0.370
Perceived susceptibility	0.057	No significance	0.675	0.501

effect of awareness was positive with coefficient of 0.202 (Table 5).

The aim of this study was to determine the prevalence of pediculosis and its related factors using the health belief model in elementary school students in the city of Khorramshahr in 2015. The prevalence of pediculosis calculated 12.9% among 170 students that similar result had reported in Abadeh city (Doroodgar *et al.*, 2011). In Iran based on many studies, the prevalence of pediculosis had been reported various amounts from 1.6% (Motevalli *et al.*, 2014) until 71.3%. In the study of Ramazani *et al.*, the prevalence of pediculosis was 30.98% (Riabi and Atarodi, 2012). The prevalence of pediculosis was 35% in elementary schools in Malaysia and in the UK and Paris 2.03% and 3.3 %, respectively and in Argentina was 29.7% (Doroodgar *et al.*, 2014).

In addition, the mean score of awareness was moderate that was consistent with the study of Moshki *et al.* (2014). There was also a positive significant relationship between health belief model's structure and awareness which indicated that whatever awareness about behaviour be higher, the rate of self-efficacy, susceptibility and other structures excluding perceived benefits will increase. These results were consistent with Moshki's study excluding in the field of self-efficacy, while in the study of Moshki *et al.* (2014), there was no relationship between behaviour and awareness.

Also awareness was the only structure that predicted 12% of behaviour changes which this result is consistent with the study of Namdar *et al.* (2012) regarding the approval of awareness for predicting behaviours. Albeit in the study of Namdar *et al.* (2012), the perceived severity and the perceived barriers also could predict preventive behaviour of cancer that was inconsistent with

our study. In addition, in the study of Hazavehei *et al.* (2015) there was no relationship between behaviour and awareness, there was no significant relationship among perceived severity, perceived benefits and susceptibility with self-care similar to results of our study. The cause of this issue can be attributed to differences between age groups because children have less comprehension of the severity and complications of an event compared with adults, especially in cases which have not previously experienced.

Mean score of self-efficacy was in high level, and students often consider themselves capable in the prevention behaviours of pediculosis that this result is coordinated with high mean score due to assessment of the behaviour barriers of students (Najimi *et al.*, 2015 and Zareban *et al.*, 2006). The low mean scores of perceived susceptibility and severity (perceived threat) among the students of this study show that most students did not face with disease and not understand the sensitivity of the subject.These results were not consistent with the study of Zare *et al.* (2013) that had reported high susceptibility of students.

Mean score of predictive behaviour of pediculosis was in optimal level in this study that was consistent with the study of Moshki *et al.* and inconsistent with the study of Zareban *et al.* (2006). This result due to the high level of self-efficacy and perceived benefits resulting from behaviour and the low level of perceived barriers also suggest that the adoption of preventive behaviours of pediculosis are deeply affected by the assessment of the ability to perform a behaviour and the benefits derived from it, then fear and threats have weak effect. Raising students' awareness about severity, complication of disease and make them sensitive about the risk of pediculosis can encourage to adopt more

effective preventive behaviours. It also found that the structures of health belief model had not a significant correlation with behaviour. These results were consistent with Zare and Moshki's study in terms of structure of susceptibility, severity and perceived benefits (Zare *et al.*, 2013).

The lack of relationship with the behaviour with the model structures can be attributed to the sample size of the study, because the high sample size in studies help to find even the small existing statistical relationship. Also the age group was 9 -10 years old children that perhaps this is the result of the lack of understanding of questions and concepts as well as the lack of their control on themselves behaviours, because the behaviour of children are under parental control at this age. But other factors also affect the behaviour excluding the health beliefs such as culture, socioeconomic status and previous experiences. Some studies have also expressed that the health belief model is generally poor to predict behaviours (Taylor *et al.*, 2006).

The results of this study showed that the knowledge was the only predictive variable of behaviour that had a significant relationship with preventive behaviour of pediculosis. As a result, elementary school students can be protected by increasing awareness of preventive behaviours and the prevalence of pediculosis can be reduced.

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