Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Assessing the link between head lice infestation and selected cognitive-behavioral factors in a sample of Iranian female adolescents

Towhid Babazadeh [a], Kamiar Kouzekanani [b], Shahram Oliaei [c], Saber Gaffari-fam [d],[*], Ghader Dargahi Abbasabad [e], Khalil Maleki Chollou [f], Sohrab Heidari [d]

[a] Department of Public Health, Sarab Faculty of Medical Sciences, Sarab, Iran
[b] College of Education & Human Development, TAMUCC 6300 Ocean Dr., Unit 5818, FC 223 Corpus Christi, TX 78412-5818, USA
[c] Center of Submarine and Hyperbaric Medicine, Health Deputy of the Iranian Navy, Tehran, Iran
[d] School of Nursing of Miandoab City, Urmia University of Medical Sciences, Urmia, Iran
[e] MSC of Epidemiology, Razi Hospital, Tabriz University of Medical Science, Tabriz, Iran
[f] Department of Nursing, Sarab Faculty of Medical Sciences, Sarab, Iran

ABSTRACT

Background: Head lice infestation is a serious health issue among adolescents in Iran. The primary purpose of the study was to determine the association of head lice infestation with cognitive-behavioral factors in female adolescents.
Methods: The study was cross-sectional, took place between September and October of 2017 in Sarab, East Azerbaijan province, Iran. Using a multi-stage sampling to recruit the study's 226 female adolescents, five of the Sarab's 13 schools were selected through simple random sampling. In the second step, the students were randomly selected using the systematic random sampling method. A survey questionnaire was used to collect the data.
Findings: The prevalence rate of head lice was calculated 20.4%, and the subjects with head lice infestation had lower levels of severity, benefits, self-efficacy, and preventive behaviors. Those without head lice infestation reported adhering to preventive behaviors. The perceived severity and self-efficacy were the statistically significant predictors of head lice infestation and use of preventive behaviors.
Conclusion: Public health authorities, with feedback from the community, must design and implement prevention programs, focusing on mothers and their school-aged children, school principals, and managers of public places as potential change agents. In addition to, perceived severity and self-efficacy should be considered as the key categories when developing these prevention programs.

1. Introduction

Head lice infestation is a serious health problem, affecting most human societies in general [1] and 3- to 13-year-old females in particular [2]. In Iran, the prevalence of this infestation among school-aged children has been reported as 27% [3] and 23.38% [4], in Thailand 50% [5], in Honduras 83% [6], and in Turkey 51.9% [7]. The transmission of the infestation is from person to person via direct contacts; for example, touching infested people's belongings [2]. Additionally, unfavorable socioeconomic status, population congestion, lower living standards, poverty status, poor health, and gender are contributing factors. Unfortunately, in Iran, the infestation has been increasing as a contagious illness due to uncontrolled population growth, migration to cities,

marginalization, and creation of small communities with inadequate health facilities [8].

The use of lindane shampoo (e.g., Permethrin 1%, and Malathion 0.5%) and public education have been helpful in controlling the infestation [9]; nevertheless, available data suggest that its prevalence in Iran cannot be ignored [10]. Therefore, contributing factors must be identified and documented so that educational intervention can be developed and implemented.

The selection of a model for health education is the first step towards the training process. Furthermore, programmed education based on an educational model is one of the practical ways of controlling and preventing diseases [11]. Previous studies suggest that theory-based interventions are more effective in influencing health-related behaviors

---

compared to non-theoretical approaches, because they provide a flexible framework to develop interventions and a guide for their evaluation [12, 13]. To do so, health researchers have utilized a fair number of theoretical frameworks to promote positive changes in health-related behaviors. The Health Belief Model (HBM) is a theory that has been known to be effective in promoting healthy behaviors and preventing various diseases [14]. According to the HBM, a person's perceptions create motivation and movement, which may positively influence behaviors by focusing on changing/altering beliefs [15].

The HBM consists of six constructs: (1) perceived susceptibility (subjective belief that a person may suffer from a disease or harmful state that is originated from a peculiar behavior), (2) perceived severity (losses due to morbidity or unhealthy behaviors), (3) perceived benefits (advantages of interventions), (4) perceived barriers (credence to expected costs of following a new behavior), (5) cues to actions (catalyzing power that leads to creating needs for doing some actions), and (6) perceived self-efficacy (confidence in skills) [16]. The use of theory and practical strategies are essential in improving the odds of success in health education and promotion. With regards to sensitivity and importance of the topic among school-age children, girls in particular, and its physical, psychosocial, economic, and cultural consequences, the primary purpose of the study was to determine the association of head lice infestation with cognitive-behavioral factors in female adolescents.

2. Methods

2.1. Subject selection and data collection

The study was cross-sectional and took place between September and October of 2017 in Sarab, East Azerbaijan, Iran. Multi-stage random sampling was used to recruit the study's 226 secondary school female adolescents from five of the Sarab's 13 schools. In the first step, five of the Sarab's 13 schools were selected through simple random sampling. In the second step, the students to be interviewed in each school were randomly selected using the systematic random sampling method from the list of all students in each school. All voluntarily agreed to participate in the study. Data were collected via a survey questionnaire. A team of trained interviewers administered the questionnaire during the participants' rest period in their schools; it was assumed that the responses were accurate.

Inclusion criteria included secondary school girls and consent to participate in the study. Exclusion criteria constituted a failure to fulfill the questionnaire wholly and correctly.

2.2. Measures

A published instrument was used to collect the following data [17]: The questionnaires were developed in Persian by Moshki et al. [17] to assess the HBM-based cognitive factors related to head lice among school-age children. A brief description of the questionnaire is as follows:

I. Demographic information included age, parents' occupation and level of education, and history of head lice infestation.
II. Knowledge was measured by nine items (e.g., head lice are transmitted from one person to another). The scoring was yes = 3, do not know = 2, no = 1; greater the score, more the knowledge.
III. HBM constructs, namely, perceived severity, perceived sensitivity, perceived benefits, and perceived barriers, were measured by 20 items (5 items per construct), using a 5-point Likert-type scaling (completely disagree = 1, disagree = 2, no idea = 3, agree = 4, completely agree = 5); self-efficacy was measured by five items (too much = 5, high = 4, medium = 3, low = 2, very low = 1); and cues to action was assessed by two items (e.g., who is helpful to you in preventing head lice?).
IV. Head lice preventive behavior was assessed by five questions (e.g., in the previous month, how often did you comb your hair?). The scoring options were always = 3, sometimes = 2, and never = 1.

Moshki et al. [17] reported the reliability coefficients, as follows, 0.86 for knowledge, 0.82 for perceived susceptibility, 0.78 for perceived severity, 0.85 for perceived barriers, 0.74 for perceived benefits, 0.76 for self-efficacy, and 0.78 for behavior. In our study, an expert panel (including four health educationists and three parasitologist) confirmed its validity. In order to assess the reliability, a pilot study was conducted on 20 students, who were not included in the final sample. The Cronbach's alpha of the scales was calculated in the pilot and as follow: 0.81 for knowledge, 0.79 for perceived susceptibility, 0.86 for perceived severity, 0.83 for perceived barriers, 0.82 for perceived benefits, 0.75 for self-efficacy, and 0.89 for behavior.

2.3. Ethics approval and consent to participate

Ethical approval to perform the study was obtained from the Ethics Committee in Sarab Faculty of Medical Science (Ethical code: IR.SAR-AB.REC.1398.002). The student' parents signed written informed consent forms after they had fully explained the essence of the study to them.

2.4. Data analysis

The data were coded, entered into the computer, and version 21 of the Statistical Package for the Social Sciences (SPSS) was used for the purpose of data manipulation and analysis. Descriptive statistics (measures of central tendency and variability, frequency and percentage distribution tables) were used to summarize and organize the data. The Shapiro-Wilk test was used to examine the normality assumption. The analysis of the data included Independent Samples t-test to examine group differences based on a continuous variable; Chi-square Test of Independence to assess the relationship between two categorical variables; Fisher's Exact Probability Test to assess the independence of two binary variables when there were cells with expected frequency of less than five; Logistic Regression to identify the best predictor of head lice infestations; Odds Ratio to examine the practical significance of the predictors of the infestations; and Hierarchical Multiple Regression to identify the best predictors of preventive behaviors. The level of significance was set, a priori, at 0.05.

3. Results

The study's 226 participants ranged in age from 10 to 15 years old (Mean = 12.7, SD = 1.12). Forty-six (20.4%) were infested with head lice. As can be seen in Table 1, none of the differences between those with and without head lice infestation based on selected demographic characteristics was statistically significant. Results are summarized in Table 1.

The subjects with and without head lice infestation were compared based on the study's major variables of interest. As shown in Table 2, at the univariate level, differences based on perceived severity, perceived benefits, perceived self-efficacy, and preventive behaviors were statistically significant. People with head lice infestation had lower levels of severity, benefits, and self-efficacy.

The frequency and percentage distribution of the use of preventive behaviors in both groups are summarized in Table 3, showing statistically significant (p < 0.05) differences for all comparisons. Generally speaking, those with head lice infestation were not adhering to preventive behaviors.

At the logistic regression analysis, perceived severity, perceived benefits, and perceived self-efficacy were the statistically significant predictors of head lice infestation. Specifically, among infested individuals, the odds of severity, benefits, and self-efficacy were 22%, 8% and 20% less, respectively, compared to those without the infestation. Results are summarized in Table 4.

We also examined the predictors of preventive behaviors, which were treated as a continuous variable. As can be seen in Table 5, perceived severity and perceived self-efficacy were the statistically significant

Table 1. Demographics characteristics of the subjects.

Variables		No Head lice	With Head lice	p-value*
Birth Order	First	79 (43.9)	23 (50)	0.27
	Second	61 (33.9)	10 (21.7)	
	Third and above	40 (22.2)	13 (28.3)	
Number of Family Members	Three	20 (11.1)	4 (8.7)	0.71
	Four	73 (40.6)	16 (34.8)	
	Five	48 (26.7)	16 (34.8)	
	Six and above	39 (21.7)	10 (21.7)	
Father's Job	Office Clerk	34 (18.9)	2 (4.3)	0.1
	Laborer	53 (29.4)	13 (28.3)	
	Teacher	21 (11.7)	7 (15.2)	
	Farmer	22 (12.2)	10 (21.7)	
	Unemployed	27 (15)	5 (10.9)	
	Other	23 (12.8)	9 (19.8)	
Mothers' Job	Office Clerk	16 (8.9)	2 (4.3)	0.19
	Teacher	20 (11.1)	9 (19.6)	
	Housewife	132 (73.3)	30 (65.2)	
	Other	12 (6.7)	5 (10.9)	
Mother's Education	Illiterate	46 (25.6)	12 (26.1)	0.99
	Primary, Secondary, High School	66 (36.6)	9 (19.6)	
	College	68 (37.8)	17 (37)	
Father's Education	Illiterate	26 (14.4)	3 (6.5)	0.24
	Primary, secondary, high school	57 (31.7)	19 (41.3)	
	College	97 (53.9)	24 (52.2)	

* Chi-square test.

predictors of head lice preventive behaviors, and together, accounted for 21.5% of the variation in the outcome measure.

4. Discussion

Despite improving public health all over the world, head lice infestation in low and middle income countries remains an important health issue [3]. A previous study reported that head lice infestation is a common and growing problem for elementary school-age students and their care takers [18]. Nearly 20% of adolescents in our study had the infestation, which has been described as an epidemic in other Iranian studies in general [19, 20], and among girls in particular [21], which could be due to cultural and religious factors, long hairs, and following the Islamic dress code by wearing *hijab*. Sadly, it has turned into a social stigma, adversely affecting the parents and their daughters the most [22].

Consequently, failure to treat the affected individuals can be instrumental in the spread of the contamination.

The head lice-infested adolescents in our study had lower perceived severity scores and higher odds of catching the disease, suggesting that when people treat it as a serious problem, they are less likely to experience it. Witte et al. defined perceived severity as a person's beliefs about the significance or magnitude of a health threat [23]. Another study suggested that pernicious outcomes of the illness could be effective in creating healthy behaviors and consequently in the prevention of the disease [19]. Similar to our results, Moshki et al. reported that perceived severity about head lice infestation was low [15]. A reason for this similarity may be the similar population included in the two studies, as they studied both female. So, there is a possibility that the females consider themselves less susceptible to head lice. If the pernicious outcomes of the illness are publicized, it is documented that it could be effective in promoting healthy behaviors and increasing the likelihood of

Table 2. Comparisons of Health Belief Model Constructs among people with Head lice and no Head lice.

Variables	Status	Mean (±SD)	Mean difference (95% CI)	p-value*
Knowledge	With Head lice	23.97 (±5.33)	- 0.24 (- 1.50 to 1.01)	0.70
	No Head lice	23.73 (±3.41)		
Perceived Susceptibility	With Head lice	19.97 (±4.53)	- 0.77 (- 2.11 to 0.56)	0.25
	No Head lice	19.20 (±4.01)		
Perceived Severity	With Head lice	16.10 (±4.53)	- 4.36 (3.07–5.65)	<0.05
	No Head lice	20.47 (±3.81)		
Perceived Barriers	With Head lice	14.19 (±5.73)	- 1.17 (- 3.15 to 0.79)	0.24
	No Head lice	13.01 (±6.14)		
Perceived Benefits	With Head lice	17.57 (±5.08)	2.07 (0.13–4.02)	<0.05
	No Head lice	19.65 (±6.1)		
Cues to Action	With Head lice	6.13 (1.96)	0.07 (- 0.62 to 0.76)	0.84
	No Head lice	6.20 (2.18)		
Perceived Self-efficacy	With Head lice	15.97 (±3.44)	2.93 (1.94–3.92)	<0.05
	No Head lice	18.91 (±2.93)		

* Independent Samples t-test.

Table 3. Group comparisons based on preventive behaviors.

Preventive Behavior	No Head lice			With Head lice			p-value*
	Always	Sometime	Never	Always	Sometime	Never	
	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	
Combing Hair	156 (86.7)	14 (7.8)	10 (5.6)	17 (37.0)	14 (30.4)	15 (32.6)	<0.05
Taking Shower	154 (85.6)	24 (13.3)	2 (1.1)	5 (10.9)	13 (28.3)	28 (60.9)	<0.05
Combing and Brushing	156 (86.7)	24 (13.3)	0 (0.0)	5 (10.9)	22 (47.8)	19 (41.3)	<0.05
Using Personal Hair-cutting Tools	139 (77.2)	32 (17.8)	9 (5.0)	17 (37.0)	12 (26.1)	17 (37.0)	<0.05
Using Personal Mattress and Blanket	161 (89.4)	16 (8.9)	3 (1.7)	5 (10.9)	15 (32.6)	26 (56.5)	<0.05

* Chi-square test.

Table 4. Logistic regression analysis to predict head lice infestation.

Variables	OR	95% C.I for OR	p-value
Knowledge	1.01	0.93 to 1.1	0.70
Perceived susceptibility	1.04	0.96 to 1.13	0.25
Perceived severity	0.78	0.71 to 0.85	<0.05
Perceived benefits	0.92	0.86 to 0.99	<0.05
Perceived barriers	1.03	0.97 to 1.08	0.24
Cues to action	0.98	0.84 to 1.14	0.84
Perceived self-efficacy	0.70	0.61 to 0.81	<0.05

preventing the disease [19, 21]. Thus, while designing the interventions, health professionals must keep in mind that an average person may not be adequately knowledgeable about this particular illness.

We also found lower perceived self-efficacy among the head lice-infested adolescents, compared to the comparison group, was a stronger predictor of the outcome, which had also been reported by other researchers [14, 24]. In the study conducted by Moshki et al., among female elementary students, self-efficacy explained 83.2% of the variance for head lice preventive behaviors [17]. Self-efficacy is the ability to perform a specific task based on a five-dimensional sense to manage the environment or behavior [25]. The self-efficacy will help people improve health behavior, such as prevention of infestation of head lice [14]. In addition, the self-efficacy of behavior promoting preventive and health is among the most commonly evaluated mediators, its role and impact as a mediator of behavioral change gained considerable support [26]. People with greater self-efficacy have loftier goals and tend to demonstrate appropriate behaviors; for example, adopting preventive behaviors. Such findings demonstrate that belief in desirable outcomes of a healthy behavior. It is necessary that educational interventions pay adequate attention to self-efficacy and promote its adoption for a particular behavior.

The high occurrence of unhealthy behaviors (e.g., not bathing, not combing) among head lice infested people was alarming, which had also been reported by Nejati et al. [27] and Nezhadali et al. [28] among female students. One study in Indonesia on pediculosis preventive behaviors among female students demonstrated many respondents with mild actions had practiced moderate prevention, whereas a small proportion

of respondents with bad behavior groups these avoidance had been poorly done [29]. It is consistent with the research that suggested behavioral variables have an association with the head lice infestation [3]. Head lice preventive behaviors among infested students were lower, compared to the comparison group, which may be due to economic, social, and cultural differences. Additionally, perceived severity and perceived self-efficacy predicted nearly one-fifth of the changes in head lice preventive behaviors. Finally, it is shown that direct contact (e.g., the use of scarf, comb, hat, and other shared items) is instrumental in the transmission of lice [30]; therefore, healthy behaviors must be encouraged to promote preventive efforts.

4.1. Delimitations and limitations

The study was delimited to females, which limited its external validity. The collection of data relied heavily on recollection of past events, which could have impacted the accuracy of the obtained data. Due to non-experimental nature of the study, no causal inferences were drawn.

5. Conclusions

We conclude that head lice infestation cannot be ruled out as an epidemic issue among female adolescents in Iran; thus, requiring actions by policymakers to alleviate it. Our results revealed that the people with no head lice had higher levels of perceived severity, perceived benefits, and perceived self-efficacy to perform preventive behaviors. As well as, we found that perceived severity and self-efficacy significantly predicted preventive behaviors and head lice infestation in adolescents. These findings indicated that the perceived severity and self-efficacy should play prominent roles in educational interventions. We recommend that public health authorities, with feedback from the community, design and implement preventive programs, focusing on mothers and their school-age children, school principals, and managers of public places as potential change agents.

Declarations

Table 5. Linear regression analysis to predict head lice preventive behaviors.

Variables	B	Standardized Coefficient	p-value
Knowledge	0.01	0.01	0.83
Perceived susceptibility	0.01	0.02	0.66
Perceived severity	0.19	0.43	<0.05
Perceived barriers	0.01	0.02	0.66
Perceived benefits	0.04	0.11	0.08
Cues to action	- 0.01	- 0.01	0.84
Perceived self-efficacy	0.18	0.30	<0.05

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

[1] R. Dehghanzadeh, M. Asghari-Jafarabadi, S. Salimian, A. Asl Hashemi, S. Khayatzadeh, Impact of family ownerships, individual hygiene, and residential environments on the prevalence of pediculosis capitis among schoolchildren in urban and rural areas of northwest of Iran, Parasitol. Res. 114 (11) (2015) 4295–4303.

[2] M. Motovali-Emami, M.R. Aflatoonian, A. Fekri, M. Yazdi, Epidemiological aspects of Pediculosis capitis and treatment evaluation in primary-school children in Iran, Pakistan J. Biol. Sci. 11 (2) (2008) 260–264.

[3] M. Moosazadeh, M. Afshari, H. Keianian, A. Nezammahalleh, A.A. Enayati, Prevalence of head lice infestation and its associated factors among primary school students in Iran: a systematic review and meta-analysis, Osong public health and research perspectives 6 (6) (2015) 346–356.

[4] H. Ghofleh Maramazi, M. Sharififard, E. Jahanifard, E. Maraghi, M. Mahmoodi Sourestani, A. Saki Malehi, S. Rasaei, Pediculosis humanus capitis prevalence as a health problem in girl's elementary schools, southwest of Iran (2017-2018), J. Res. Health Sci. 19 (2) (2019).

[5] O.U. Singhasivanon, S. Lawpoolsri, M. Mungthin, S. Yimsamran, N. Soonthornworasiri, S. Krudsood, Prevalence and alternative treatment of head-lice infestation in rural Thailand: a community-based study, Kor. J. Parasitol. 57 (5) (2019) 499.

[6] S. Jamani, C. Rodríguez, M.M. Rueda, G. Matamoros, G. Bearman, M. Stevens, A. Sanchez, Head lice infestations in rural Honduras: the need for an integrated approach to control neglected tropical diseases, Int. J. Dermatol. 58 (5) (2019) 548–556.

[7] O. Aysel, E. Unal, R. Leman Ceki, The prevalence of pediculus capitis and personal hygiene status in two vocational high schools, Int. J. Caring Sci. 12 (2) (2019) 1–8.

[8] A. Vahabi, K. Shemshad, M. Sayyadi, A. Biglarian, B. Vahabi, S. Sayyad, M. Shemshad, J. Rafinejad, Prevalence and risk factors of pediculus (humanus) capitis (anoplura: pediculidae), in primary schools in sanandaj city, kurdistan province, Iran, Trop. Biomed. 29 (2) (2012) 207–211.

[9] R. Speare, P.G. Buettner, Head lice in pupils of a primary school in Australia and implications for control, Int. J. Dermatol. 38 (4) (1999) 285–290.

[10] Z.G. Shirvani, F.A. Shokravi, M.S. Ardestani, Evaluation of a health education program for head lice infestation in female primary school students in Chabahar City, Iran, Arch. Iran. Med. 16 (1) (2013) 42.

[11] T. Babazadeh, H. Nadrian, S. Ranjbaran, H. Rezakhani-Moghaddam, M. Aghemiri, Cognitive factors associated with Brucellosis preventive behaviours among diagnosed patients: an application of Empowerment Model, East. Mediterr. Health J. 25 (8) (2019) 567–574.

[12] T. Babazadeh, H. Nadrian, M. Banayejeddi, B. Rezapour, Determinants of skin cancer preventive behaviors among rural farmers in Iran: an application of protection motivation theory, J. Canc. Educ. 32 (3) (2017) 604–612.

[13] A. Saghafipour, J. Nejati, E. Mozaffari, F. Rezaei, Z. Gharlipour, M. Mirheydari, The effectiveness of education based on BASNEF model on promoting preventive behavior of cutaneous leishmaniasis among students, Int. J. Pediatr. 5 (6) (2017) 5125–5136.

[14] K. Glanz, B.K. Rimer, K. Viswanath (Eds.), Health Behavior and Health Education: Theory, Research, and Practice, John Wiley & Sons, 2008.

[15] M. Moshki, F. Zamani-Alavijeh, M. Mojadam, Efficacy of peer education for adopting preventive behaviors against head lice infestation in female elementary school students: a randomised controlled trial, PloS One 12 (1) (2017), e0169361.

[16] I. Zareban, M. Abbaszadeh, M. Moodi, H. Mehrjoo Fard, H.R. Ghaffari, Evaluating a health- education program in order to reduce infection to Pediculus Humanus Capitis among female elementary students, J Birjand Univ Med Sci 13 (1) (2006) 9–15.

[17] M. Moshki, F. Zamani-Alavijeh, M. Mojadam, Preventive behaviors of female elementary students in regard to pediculosis infestation based on health belief model (HBM), J. Health Dev. 3 (3) (2014) 269–281.

[18] A. Dehghani Tafti, Z. Rahaei, M. Askari Shahi, T. Hakimi, The effect of educational program on the prevention of pediculosis in primary school fifth grade students: an application of the health belief model, SBRH 2 (1) (2018) 134–143 [Text in Persian].

[19] H. Kassiri, M.-H. Feizhaddad, M. Abdehpanah, Morbidity, surveillance and epidemiology of scorpion sting, cutaneous leishmaniasis and pediculosis capitis in Bandar-mahshahr County, Southwestern Iran, J. Acute Dis. 3 (3) (2014) 194–200.

[20] Z. Khakshoor-Gharehsoo, N. Peyman, The effect of education to increase the awareness and preventive behaviors of pediculosis in school students according to the health belief model in mashhad, Health Edu. Health Promotion 5 (2) (2017) 33–43.

[21] M. Nazari, M.R. Fakoorziba, F. Shobeiri, Pediculus capitis infestation according to sex and social factors in Hamedan, Iran, Southeast Asian J. Trop. Med. Publ. Health 37 (2006) 95–98.

[22] E. Moradiasl, Risk factors associated with head lice (pediculosis) infestation among elementary school students in Meshkinshahr county, North West of Iran, Int. J. Pediatr. 6 (3) (2018) 7383–7392.

[23] k. Witte, Putting the fear back into fear appeals: the extended parallel process model, Commun. Monogr. 59 (4) (1992) 329–349.

[24] M. Jahani eftekhari, N. Peyman, The effect of educational intervention based on protection motivation theory on promoting pediculosis preventive behaviors among elementary school girls in neyshabur, J. Educ. Community Health 5 (2) (2018) 1–9.

[25] A. Bandura, On the Functional Properties of Perceived Self-Efficacy Revisited, 38, Sage Publications Sage CA, Los Angeles, CA, 2012, pp. 2012 9–201244 (1).

[26] A. Luszczynska, M.S. Hagger, A. Banik, K. Horodyska, N. Knoll, U. Scholz, Self-efficacy, planning, or a combination of both? A longitudinal experimental study comparing effects of three interventions on adolescents' body fat, PloS One 11 (7) (2016), e0159125.

[27] J. Nejati, A. Keyhani, A.T. Kareshk, H. Mahmoudvand, A. Saghafipour, M. Khoraminasab, R.T. Oliaef, S.M. Mousavi, Prevalence and risk factors of pediculosis in primary school children in South West of Iran, Iran. J. Public Health 47 (12) (2018) 1923.

[28] A. Nezhadali, T. Babazadeh, H. Nadrian, H. Allahverdipour, Cognitive factors associated to pediculosis preventive behaviors among school-age children in Chaldoran county, Iran, J. Multidiscip. Healthc. 13 (2020) 19–26.

[29] K. Kristiawati, P.D. Rachmawati, R. Setyowati, Setyowati. Factors affecting Pediculosis capitis prevention at Islamic boarding school in Indonesia. 8th International Nursing Conference on Education, Practice and Research Development in Nursing, Atlantis Press, 2017.

[30] A. Saghafipour, J. Nejati, A.Z. Ramazani, H. Vatandoost, E. Mozaffari, Prevalence and risk factors associated with head louse (Pediculus humanus capitis) in Central Iran, Int. J. Pediatr. 5 (7) (2017) 5245–5254.