Socio-psychological Predictors of Preventive Behaviors against Pediculosis among Students: Application of Health Belief Model

Abstract

Background and Objective: Head lice infestation is a common and significant health issue among students and in school settings. It is specifically more prevalent in children aged 5-13 years. This study aimed to investigate the determinants of preventive behaviors against pediculosis based on the theoretical framework of Health Belief Model in among students in urban areas of Heris County.

Materials and Methods: This descriptive-analytical correlation study was conducted on 1000 students in urban schools in Heris County from East Azerbayjan. Data were collected by census from all fourth and fifth-grade students in elementary schools. The research instrument was a questionnaire designed based on the Health Belief Model, which had been validated and its reliability was confirmed in previous studies. After the completion of the questionnaires by the students, the data were analyzed using SPSS16 and statistical tests, ANOVA and multiple linear regression.

Findings: Fourth-grade students had higher awareness (P=0.027) compared to fifth-grade students. Perceived susceptibility (P=0.001) and perceived barriers (P=0.004) were significantly (P=0.000) higher in individuals with no history of pediculosis infestation compared to those with a history of pediculosis infestation. Except for the perceived severity construct, all components of the Health Belief Model had a significant correlation with preventive behaviors against pediculosis. Moreover, awareness (P=0.000), self-efficacy (P=0.000), perceived barriers (P=0.000), gender (P=0.000), and maternal education (P=0.024) were identified as ultimate predictors of the behaviors, and these variables collectively had the power to predict 21.5% of behavior changes (R^2=0.215).

Conclusion: Awareness, self-efficacy, and perceived barriers play a significant role in adopting preventive behaviors against pediculosis infestation. Designing, implementing, and evaluating educational interventions is recommended to promote pediculosis preventive behaviors in schools, using appropriate theoretical frameworks such as the Health Belief Model.

Keywords: Pediculosis, Health Belief Model, Students, Head Lice.

Introduction

Public health and well-being are of paramount importance in any society, as the progress of communities is closely tied to the overall health of its individuals. Among the factors that threaten community health, infestations by insects, especially ectoparasites, remain a health issue, despite advancements in healthcare and medical sciences, and continue to be a health challenge [1]. Lice, specifically Anoplura (Phthiraptera), are obligate blood-sucking parasites that infest mammals, including humans. Over 550 species have been described worldwide, many of which are host-specific, targeting a particular mammal [2]. Infestations of lice on the body, head, or pubic area are referred to as pediculosis [3]. Head lice (Pediculus Humanus Capitis), body lice (Pediculus Humanus Corporis), and pubic lice (Phthirus Pubis) are all blood-sucking ectoparasites that affect humans [4]. Among these, body lice are known to transmit diseases such as epidemic typhus, relapsing fever, and trench fever, while head lice are not disease vectors. In recent years, the prevalence of body lice has decreased, especially in affluent societies, due to improved living standards. However, head lice infestations are still reported worldwide. Although head lice have a global distribution, they are more commonly found in temperate regions and their annoyance and discomfort can be compared to mosquito-related problems in tropical areas. Factors such as population growth and poor hygiene exacerbate lice infestations, with a higher prevalence observed in densely populated, impoverished communities. It affects all social and economic strata during epidemics [2,3]. The prevalence of head lice infestations in children aged 5 to 13 years is higher than in other age groups, with a greater incidence in girls than in boys. Schools, especially elementary schools, play a significant role in the occurrence of head lice epidemics [5]. Among children and women, having a dense head of hair is associated with a higher risk of lice infestation than in other age groups [6]. The prevalence of lice infestations in elementary schools in developed countries is estimated to be between 2% to 10% [7]. Unfortunately, lice infestations in Iran has emerged as a public health issue alongside other infectious diseases in some regions due to factors such as uncontrolled population growth, rural-to-urban

migration, settlement in marginalized areas, the establishment of satellite towns with minimal sanitary facilities, and it [8]. It annually infests between 6 to 12 million individuals worldwide [14]. Studies conducted outside of Iran have reported the prevalence of head lice infestations in elementary school students as a variable. For example, in 2011, a study conducted among 940 students in a rural area in Yucatan, Mexico, reported a prevalence of 13.6% for head lice infestations [15]. In 2012, the prevalence of head lice infestations in Thailand was reported to be 32.23% [16]. Results of studies conducted in 2015 in the European Union and Norway reported head lice infestation prevalence rates of 3.44% and 1.2%, respectively [17]. The prevalence of head lice infestations in Iran varies in different regions. For instance, the prevalence of head lice infestation in female elementary school students in Qom was reported as 6.7% [19], in Sari County, it was 65.1% [14], in the counties of Tonekabon and Pakdasht, and Qom Province, it was reported as 74.5%, 3.1%, and 3.13%, respectively [1, 18 and 19], in Kalaleh and Bonab counties, it was 28.6% and 82.2%, respectively [20 and 21]. A systematic review and meta-analysis conducted in 2015 to determine the prevalence of head lice among Iranian elementary school students reported a prevalence of 1.6% for boys and 8.8% for girls [22]. Individuals affected by pediculosis may experience irritation, sensitivity, and fatigue due to the entry of foreign insect saliva proteins into the host's body through insect bites. Repeated injection of louse saliva can lead to severe allergies, such as intense itching. Scratching the site of the bite, apart from skin inflammation, can also lead to secondary infections, such as fungal and bacterial infections, which can result in the development of yellow ulcers and swelling of lymph nodes (lymphadenopathy) around the neck and behind the ears [9]. In addition to the health issues associated with pediculosis, individuals affected by this condition may also face social difficulties, such as feelings of shame and inferiority, psychological disturbances, depression, insomnia, decreased academic performance, and a loss of social status among their peers [10].

The most significant mode of transmission for infestation is through direct head-to-head contact with an infested person. Additionally, infestation can occur indirectly through contact with infested clothes, personal items (combs, towels, etc.), bed or furniture covers infested with lice or their eggs [11]. The most important prevention methods for avoiding head lice infestation include practicing personal hygiene (particularly regular bathing), refraining from sharing personal items (combs, brushes, and hats), and promptly reporting cases of infestation to the nearest healthcare facility, using insecticidal shampoos by those affected and their family members, and educating the community in infested areas and promoting overall hygiene [12].

One of the most effective and widely used psychosocial approaches in describing health-related behaviors, which has been successfully applied in various health-related topics for nearly half a century, is the Health Belief Model (HBM). The Health Belief Model is a psychological model that describes and predicts health behaviors by emphasizing individuals' attitudes and beliefs. It was developed in 1950s by a group of social psychologists to explain the reasons behind people's lack of participation in disease prevention or diagnosis programs [13]. Given the importance and vulnerability of elementary school-aged children and the high prevalence of head lice infestations in the research area, along with the physical, psychological, social, and economic consequences associated with it, this study aimed to investigate the determinants of preventive behaviors against pediculosis in second-grade students in urban areas of Heris County, East Azerbayjan Province of Iran, using the theoretical framework of the Health Belief Model for the first time.

Materials and Methods

Study Design & Population

This descriptive-analytical correlational study was conducted on 1000 elementary school students, both girls and boys, in urban areas of Heris County. Data collection was carried out through a census of all fourth and fifth-grade students in urban elementary schools.

Instrument & Data Collection

The researcher visited the selected schools and distributed questionnaires among the students. Data collection in this research was performed using a self-report questionnaire. The questionnaire consisted of 65 items and 6 sub-scales to measure the components of the Health Belief Model (HBM). All questions were multiple-choice with three options. The sub-scales included: awareness regarding head lice infestation, consisting of 31 items **(score ranging from 0 to 62)**, perceived susceptibility and perceived severity regarding head lice infestation, each consisting of 6 items **(score ranging from 0 to 12)**, perceived benefits of preventive behaviors against head lice infestation, consisting of 7 items **(score ranging from 0 to 14)**, perceived barriers to preventive behaviors against head lice infestation, consisting of 9 items **(score ranging from 0 to 18)**, and perceived self-efficacy for

performing preventive behaviors against head lice infestation, consisting of 6 items **(score ranging from 0 to 12)**. To assess preventive behaviors, 4 multiple-choice questions were used, with (**scores ranging from 0 to 17**). The highest score in each question was assigned to the option considered by the researcher as a preventive behavior. **In this research, the content and form methods were used for the validity of the questionnaire, and the internal consistency method (Cronbach's alpha) was used for the reliability of the questionnaire [25].**

Data Analysis

After students completed the questionnaires and coding was done, data analysis was performed using descriptive statistics such as frequency, mean, and standard deviation, as well as Pearson correlation tests. Multiple linear regression was employed to investigate the predictors of preventive behaviors using HBM constructs. All statistical analyses were conducted using SPSS version 16.

Ethical Considerations

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences in Tehran, with the code IR.SBMU.PHNS.REC.1397.41. The participation of individuals in the study was done with informed consent from the parents of the students. The questionnaires were anonymous, and the confidentiality of participants' information was strictly maintained throughout the study, to adhere to ethical principles.

Findings

The mean age of the students included in the study was 11.02 ± 0.55 years, ranging from a minimum of 10 to a maximum of 12 years. Regarding the occupation of their fathers, 45% were self-employed, while 92% of the mothers were Housewife. In terms of education, 62% of the fathers and 66% of the mothers had elementary education. Concerning birth order, 47% of the students were fourth-born (Table 1).

Table 1: Frequency Distribution of Demographic Characteristics of Study Samples

Variable	Variable Categories	N	%
Gender	Male	512	51
	Female	488	48
Education Level	Fourth Grade	508	50
	Fifth Grade	492	49
Students' Age	10 years old	204	20
	11 years old	570	57
	12 years old	226	22
Father's Education	Elementary	620	62
	Middle School and High	380	38
Mother's Education	Elementary	663	66
	Middle School and High	337	33
Father's Occupation	Worker	327	32
	Employee	219	21
	Self-employed	454	45
Mother's Occupation	**Housewife**	928	92
	Employee	72	7
Number of Family Members	4	470	47
	5	308	30
	6 and more	140	14

Students in the fourth grade had higher levels of awareness (p=0.027) compared to students in the fifth grade, and this difference was statistically significant. Additionally, the constructs of awareness (p=0.001), perceived severity (p=0.026), perceived barriers (p=0.000), and behaviors (p=0.000) were significantly associated with the father's occupation. In other words, the level of awareness in students whose parents were employees was higher than those with self-employed or worker parents. Awareness (p<0.001), perceived severity (p=0.03), perceived barriers (p=0.001), and behaviors (p=0.007) were also significantly associated with the history of lice infestation in students' parents. In other words, the history of lice infestation in students' parents had an impact on the

constructs of awareness, perceived severity, and perceived barriers in students. The constructs of perceived barriers (p=0.05) and behaviors (p=0.01) showed a significant difference based on maternal education. There was also a significant difference in the mean scores of perceived barriers (p=0.004), perceived susceptibility (p=0.001), and behaviors (p=0.05) between students with a history of lice infestation and those without a history (Table 2).

Table 2: Comparison of Health Belief Model Constructs' Scores by Demographic Variables

Demographic Variables	Awareness	Perceived Susceptibility	Perceived Severity	Perceived Barriers	Perceived Benefits	Self-efficacy	Behaviors
Education Grade							
Fourth Grade	65±12.68	72±13	73±15.25	59.23±15.30	80.82±17	79.89±17.27	69.41±13.98
Fifth Grade	63.5±11.5	72.3±14.42	73.96±16.62	60.18±15.76	79.21±17.77	79.99±16.50	69.97±13.83
Level of Significance	0.027*	0.799	0.386	0.331	0.143	0.932	0.525
Father's Education							
Elementary	63.81±12.32	72.17±13.57	74.15±15.63	60.41±15.50	79.59±17.04	80.18±16.42	69.23±13.59
Middle and High School	65.29±11.86	72.20±14.05	72.47±16.39	58.53±15.52	80.73±17.97	79.54±17.64	70.43±14.38
Level of Significance	0.06	0.973	0.10	0.06	0.31	0.56	0.18
Mother's Education							
Elementary	64.27±12.34	72.05±13.70	73.73±15.67	60.37±15.23	79.90±16.97	79.64±16.39	68.90±13.69
Middle School and High	64.55±11.82	72.45±13.86	73.09±16.45	58.38±16.03	80.27±18.24	80.53±17.83	71.23±14.20
Level of Significance	0.73	0.66	0.55	0.05*	0.75	0.43	0.01*
Father's Occupation							
Worker	38.62±97.11	47.72±03.14	88.74±23.16	03.62±21.16	50.78±74.17	18.79±68.16	30.67±52.14
Employee	93.65±13.11	70.72±30.14	15.71±40.16	73.56±91.14	93.81±51.17	64.80±42.17	27.72±62.13
Self-Employed	05.65±61.12	73.71±28.13	66.73±39.15	44.59±08.15	20.80±03.17	15.80±79.16	16.70±33.13
Level of Significance	0.001*	0.62	0.026*	0.000*	0.075	0.57	0.000*
Mother's Occupation							
Housewife	64.41±12.22	72.20±13.51	73.57±15.65	59.90±15.34	80.15±17.03	80.21±16.53	69.49±13.82
Employee	63.86±11.43	71.99±16.63	72.76±19.33	56.99±17.68	78.43±21.68	76.46±20.81	72.22±14.75
Level of Significance	0.69	0.89	0.67	0.12	0.42	0.07	0.10
Students' Previous History of Infestation							
Yes	64.39±12.42	75.27±12.93	74.53±15.49	62.79±15.15	81.06±16.65	80.53±17.32	67.96±12.78
No	64.36±12.11	71.54±13.83	73.30±16.03	59.05±15.54	79.81±17.55	79.82±16.80	70.05±14.10
Level of Significance	0.97	0.001*	0.34	0.004*	0.37	0.61	0.05*

Parents' Previous History of Infestation							
Yes	60.19±12.36	73.79±14.17	76.30±14.94	64.56±16.22	79.43±16.68	77.58±16.99	66.62±12.35
No	64.90±12.04	71.98±13.69	73.16±16.03	59.07±15.34	80.10±17.49	80.24±16.86	70.08±14.04
Level of Significance	<0.001	0.18	0.03	0.001	0.69	0.11	0.007

P<0.05*

The Pearson correlation coefficient test showed a significant correlation between awareness (P=0.000, r=0.336), perceived susceptibility (P=0.000, r=0.146), perceived benefits (P=0.000, r=0.241), perceived barriers (P=0.000, r=-0.273), self-efficacy (P=0.000, r=0.299), and preventive behaviors against Pediculosis infestation. Additionally, there was a significant correlation between awareness and perceived susceptibility (P=0.000, r=0.326), perceived severity (P=0.000, r=0.231), perceived benefits (P=0.000, r=0.425), perceived barriers (P=0.000, r=-0.330), and self-efficacy (P=0.000, r=0.315) (Table 3). Furthermore, the Pearson correlation coefficient test indicated that there is a significant positive correlation between gender (P=0.000, r=0.167), age (P=0.000, r=0.069), mother's education (P=0.000, r=0.079), and father's occupation (P=0.000, r=0.082) with preventive behaviors (Table 4).

Table 3: Correlation between components of the Health Belief Model and preventive behaviors against Pediculosis infestation in the studied students

Variable	Awareness	Perceived Susceptibility	Perceived Severity	Perceived Benefits	Perceived Barriers	Perceived Self-efficacy	Behaviors
Awareness	1						
Perceived Susceptibility	★★0.326 <0.001	1					
Perceived Severity	0.425 0.000	0.379 0.000	1				
Perceived Benefits	0.425 0.000	0.000	0.478 0.000	1			
Perceived Barriers	-0.33 0.000	★-0.028 0.385	0.118 0.000	-0.042 0.181	1		
Perceived Self-Efficacy	0.315 0.000	★0.327 0.000	★★0.288 0.000	0.514 0.000	0.014 0.665	★1	
Behaviors	0.336 0.000	0.146 0.000	0.030 0.337	0.241 0.000	-0.273 0.000	0.299 0.000	1

★★ Level of significance 0.01, ★ Level of significance 0.05

Table 4: Correlation between demographic variables and preventive behaviors against the Pediculosis in the studied students

Variable	Education Level	Gender	Age	Father's Education	Mother's Education	Father's Occupation	Mother's Occupation	Number of Family Members	Behaviors
Education Level	1								

Gender	0.965	1							
Age	0.434 0.000	-0.078 0.013	1						
Father's Education	-0.062 0.051	-0.04 0.203	- 0.03 3 0.30	1					
Mother's Education	-0.02 0.363	-0.05 0.08	0.00 5 0.87	0.56 0.000	1				
Father's Occupation	-0.04 0.18	-0.09 0.002	0.00 4 0.90	0.11 0.000	0.08 0.007	1			
Mother's Occupation	-0.02 0.40	-0.04 0.16	- 0.00 3 0.91	0.23 0.000	0.268 0.000	-0.02 0.47	1		
Number of Family Members	0.029 0.361	0.074 0.02	0.05 1 0.10	-0.07 0.027	- 0.088 0.006	-0.035 0.27	-0.053 0.09	1	
Behaviors	0.02 0.52	0.167 0.000	0.06 9 0.02	0.042 0.18	0.079 0.01	0.082 0.009	0.051 0.10	-0.04 0.2	1

In the first phase of regression analysis and to predict behaviors using the constructs of the Health Belief Model, it was determined that among the constructs of the health belief model, the constructs of Awareness (p=0.000), Self-efficacy (p=0.000), and Perceived Barriers (p=0.000) were predictors of preventive behaviors. Their predictive power of the behavior changes was 19.3% (R^2 = 0.193) (Table 5). In the second phase of regression analysis and to predict behaviors using demographic variables, Gender (P=0.000), Father's Occupation (P=0.003), Age (P=0.007), and Mother's Education (P=0.009) were predictors of preventive behaviors, and they predicted 5.1% (R^2=0.051) of the behavior changes (Table 6). In the final phase of regression analysis and to predict behaviors using all research variables, it was found that the variables of Awareness (P=0.000), Self-efficacy (P=0.000), Perceived Barriers (P=0.000), Gender (P=0.000), and Mother's Education (P=0.024) were determined as the ultimate predictors of behaviors. In total, these variables predicted only 21.5% (R^2=0.215) of the behavior changes (Table 7).

Table 5: Regression model findings for predicting pediculosis preventive behaviors

Independent Variable	**B**	**SE**	**Beta**	**t**	**P-value**	**R**	**R^2**
(Fixed)	51.20	3.31	-	15.47	0.000		
Awareness	0.216	0.037	0.19	5.91	0.000		
Perceived Self-efficacy	0.199	0.025	0.242	7.98	0.000	0.440	0.193
Perceived Barriers	-0.189	0.027	-0.212	-6.96	0.000		

Table 6: Regression model findings for predicting preventive behaviors for pediculosis by demographic variables

Variables	**B**	**SE**	**Beta**	**t**	**P-value**	**R**	**R^2**
(Fixed)	36.23	7.65	-	4.73	0.000		
Gender	5.19	0.86	0.18	5.99	0.000		
Father's Occupation	1.48	0.49	0.093	2.99	0.003	0.22	0.051
Age	1.76	0.65	0.083	2.68	0.007		

Mother's Education	2.38	0.91	0.081	2.61	0.009

Table 7: Regression model findings for ultimate predictors of preventive behaviors for pediculosis

Variable	B	SE	Beta	t	P-value	R	R^2
(Fixed)	43.38	3.65	-	11.87	0.000		
Awareness	0.21	0.036	0.19	6.03	0.000		
Self-efficacy	0.18	0.025	0.22	7.55	0.000		
Perceived Barriers	-0.18	0.027	-0.202	-6.71	0.000		
Gender	3.83	0.78	0.138	4.87	0.000	0.215	0.46
Mother's Education	1.87	0.82	0.064	2.26	0.024		

Discussion

This study aimed to investigate the determinants of preventive behaviors against pediculosis based on the Health Belief Model among 1000 fourth and fifth-grade elementary students in urban areas of Heris County. Given the effectiveness of the Health Belief Model in various studies, it was also used in this study to examine the determinants of preventive behaviors against pediculosis. Regarding the relationship between the components of the Health Belief Model and demographic variables, students' awareness of pediculosis was found to be at a moderate level. This result is consistent with the findings of studies by Zareban et al., Gholamnia Shirvani et al., and Moshki et al., which also reported moderate levels of awareness among students regarding pediculosis[23,24]. A study conducted by Heukelbach and Ugbomoiko in a village in Nigeria showed very low awareness about transmission and treatment methods among the study group [26]. Another study by Maghalhaes et al. in southeastern Angola among elementary school children showed that 56.7% of the students had no knowledge about the treatment of pediculosis. All of these studies indicate a lack of knowledge among students in this area [27]. The results of the current study indicated that fourth-grade students had higher awareness than fifth-grade students, and there was a significant relationship between awareness, perceived severity, perceived barriers, and preventive behaviors with the father's occupation. In other words, the level of awareness was higher in students whose parents were employees compared to those with self-employed or worker parents. These findings are consistent with the results of studies conducted by Norouzi [28], Poorbaba [29], Rafiei [30], Rafinejad [31], Saqafi-pour [32], and Soleimanizadeh [33]. The findings of this study also demonstrated significant correlations between all components of the Health Belief Model, except for perceived severity, and preventive behaviors against pediculosis. These results are in line with the findings of studies by Mozloomi et al. [35] and Baqiyani Moghaddam et al. [34], which investigated preventive behaviors against type 2 diabetes. Furthermore, the study results showed a significant correlation between perceived susceptibility and self-efficacy. This finding is consistent with the results of studies conducted by Vermandere et al[36]., Grace-Letch et al. [37], and Consedine et al[38]. results of this study demonstrated a significant correlation between awareness and perceived severity with self-efficacy. This was consistent with the findings of studies conducted by Morowati Sharifabad et al. [39] and Moshki et al. [25] on preventive behaviors against pediculosis. Additionally, there was a significant correlation between perceived severity and perceived susceptibility, which aligns with the findings of the study by Panahi et al. [40]. In the present study, significant correlations were observed between perceived barriers, perceived benefits, self-efficacy, and perceived severity. This corresponds to the results of studies conducted by Namdar et al. [41] and Didarloo et al. [42], which focused on adopting preventive behaviors against cervical cancer. Moreover, a significant correlation was found between preventive behaviors and self-efficacy, which was consistent with the findings of studies conducted by Khodaveisi et al., which investigated predicting factors for adhering to infection control standard precautions among pre-hospital emergency staff [43], the study by Panahi et al. on preventive behaviors against smoking among students [40], and the study by Namdar et al. [41]. In this research, perceived barriers of students and their behaviors showed a significant relationship with the mother's education level, which is in line with the results of studies by Modaresi [18], Haghi et al. [14], Norouzi [28], Poorbaba [29], Rafiei [30], Rafinejad [31], and Saqafi-pour which examined the epidemiology of pediculosis (head lice) and its associated factors among female elementary

school students in Qom Province [32]. These findings also correspond to the results of the study by Soleimanizadeh [33].

Finally, the regression analysis identified awareness, self-efficacy, perceived barriers, gender, and mother's education level as the ultimate predictors of preventive behaviors. This is consistent with the results of Namdar et al., which assessed the utility of the Health Belief Model constructs in predicting preventive behaviors against cervical cancer and introduced perceived barriers as the ultimate predictors of behaviors [41]. In addition, it aligns with the findings of Mehri et al. [44], Mazaheri et al., who investigated the impact of health education based on the Health Belief Model on promoting preventive behaviors against dental caries among students [45], and Tanner-Smith and Brown [46] in the United States, Didarloo's study, which examined the relationship between Health Belief Model constructs and the intention to vaccinate against human papillomavirus among female students, identified self-efficacy as the ultimate predictor of behaviors [42]. These results are also consistent with the findings of the study conducted by Moshki et al., which focused on investigating preventive behaviors against pediculosis among female students in Gonabad, where perceived barriers were identified as the ultimate predictor of preventive behaviors [25].

Limitations

There are several limitations to this study. First, the use of self-report questionnaires, given the young age of the fourth and fifth-grade students, may introduce errors in completing the questionnaires. Additionally, using the Health Belief Model and not considering the variables outside of these theoretical framework can be considered another limitation of this study.

Conclusion

According to the research results, it is evident that awareness, perceived barriers, self-efficacy, gender, and mother's education are significant ultimate predictors of preventive behaviors. Therefore, it is essential to develop appropriate educational programs based on the Health Belief Model, which can have a more substantial impact on preventive behaviors against pediculosis. Given the influential role of healthcare workers, teachers, and parents in promoting preventive behaviors against head lice infestation among students, it is recommended to design and evaluate effective interventions for enhancing the health literacy of parents and school staff.

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Ethical permissions

The researchers observed all the ethical codes including informed consent, confidentiality, plagiarism, double publication, date manipulation, and fake data generation. The study received approval ethical research code from ethics Committee of Shahid Beheshti University of Medical Sciences (IR.SBMU.PHNS.REC.1397.41.).

Conflicts of interests

All authors of this article declare they have no conflict of interests.

Authors contribution

All authors contributed to the study conception and design.

Eslam Shafei contributed in implementation of study phases, data collection, intervention, data analysis, and writing original draft.

Sakineh Rakhshanderou contributed in methodology, data analysis and interpretation of data.

Mohtasham Ghaffari contributed in supervision, methodology, review & editing, project administration.

Hossein Hatami contributed in methodology and as advisor of Thesis.

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