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Commitment to Action: An Effective Construct on Increasing Effectiveness of an Educational Intervention to Control Pediculosis Capitis in Female High School Students

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ABSTRACT

Aims Pediculosis Capitis is one of the most common parasitic infections in female students with various complications. Commitment to action as an important determinant of behavior can reinforce interventions. This study evaluated the effect of commitment to action on increasing the effectiveness of education to control Pediculosis Capitis in students.

Methods This experimental study was conducted on 150 female high school students in Firoozkooh in 2017. Participants were selected by multistage cluster sampling and randomly assigned to three groups of 50 people. Two intervention groups, including education and education with a commitment to action and one control, participated. Data were collected by a valid and reliable questionnaire of knowledge, attitude, behavior, commitment to action, and examination at baseline and one month after education. Data were analyzed by SPSS 21 using ANCOVA and logistic regression ($p<0.05$).

Findings an increase in knowledge, attitude, behavior, commitment to action, and a reduction in Pediculosis Capitis were observed ($p<0.001$) in the intervention groups. Also, there were significant differences in behavior, commitment to action, and Pediculosis Capitis ($p<0.001$) in the second intervention group than first. The effectiveness of the intervention was moderate to high (0.79 to 0.95). Factors influencing Pediculosis Capitis included the number of family members, number of people in the bedroom, history of infection, number of bedrooms, knowledge, attitude, behavior, and commitment to action ($p<0.001$).

Conclusions Applying commitment to action increases the effectiveness of the education on improving knowledge, attitude, behavior, and Pediculosis Capitis control in female high school students.

Keywords Pediculus; Health Education; Student

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Introduction

Pediculosis is the most common parasitic infection worldwide, and it was first reported in prehistoric times. Lice infestation is also common in the U.S., UK, France, Canada, Brazil and India [1]. The prevalence of pediculosis capitis is reported at 6% and 30% in different parts of Iran [2]. Also, hundreds of thousands of people are newly infected with this parasite each year [1]. Head lice prevalence has been reported to be 8.8% in female girl school students [3]. Girls are more likely to be affected than boys, and schoolchildren are more likely to be infected than adults [4]. Head lice infestation can cause social exclusion of the patient and his family. Head lice are not only the carriers of typhus, relapsing fever and trench fever, but their biting and feeding can also cause itching and burning in the skin, and following scratching the skin, several complications such as impetigo and anemia can be occurred [5]. Health education as an effective approach to address prevention at all stages is considered one of the key areas in controlling and preventing diseases, such as pediculosis [4]. Health education encourages and empowers people to accept and consider voluntary health behaviors, reasonable use of available health services, make decisions for promoting and improving their health, increase awareness about disease prevention, and change attitudes and behavior [6]. Due to the high prevalence of Pediculosis in students, school-based health education effectively prevents and controls head lice [4, 7]. Pender's Health Promotion Model has been used as a framework for planning interventions to improve healthy behaviors [6]. Commitment to the plan of action of the construct of Pender's health promotion model as an important determinant of behavior can play an effective role in strengthening the effect of interventions [8]. The concept of intention and identification of a planned strategy leads to the implementation of health behavior. The greater the commitments to a specific plan of action, the more likely health-promoting behaviors will be maintained over time [9].

As far as the researcher knows, no study has examined the effect of this structure on increasing the effectiveness of an educational intervention to prevent and control head lice in students. Therefore, the present study aimed to evaluate the effect of commitment to action on the effectiveness of an educational intervention to control head lice in female high school students.

Methods

This experimental study was conducted on female high school students in Firoozkooh, Tehran, in 2017. Participants were randomly selected by multistage cluster sampling. Of the 18 governmental girls' secondary schools in the Firoozkooh, three schools were randomly selected. Each of these schools was randomly assigned to intervention and control groups. Three classes were randomly selected from each school. The sample size was calculated by Pocock's formulae, considering 90% power and confidence limits of 95% estimated about 42 students, to cover a reduction of %15, 50 students on each group were entered randomly. Inclusion criteria included secondary education and willingness to participate in the study. Exclusion criteria were the existence of any physical or mental prohibition to participate in the study.

Data gathered by researcher-made demographics, knowledge, attitude, behavior, and commitment to action questionnaires. Content validity of the questionnaire evaluated. Ten related experts assessed the instrument based on the grammar, wording, item allocation, and scaling. Content validity ratio (CVR=0.62-0.7) and content validity index (CVI=0.8-0.9) were used for quantitative assessment. To assess face validity, the participants declared that they had no problems reading and understanding the items. The impact score was 4.5-4.8 for the total scale. Internal consistency and stability of the instrument assessed by Cronbach's alpha coefficient (knowledge α=0.78, Attitude α=0.89, Practice α=0.83, commitment to action α=0.73, and total α=0.79), and the intraclass correlation coefficient was 0.9. Thirty students filled out the questionnaire two times at a two-week interval. This 32-item questionnaire consisted of four sections: Knowledge consisted of 14 items that received the answer to the correct option of one point and the answer to the wrong option, or I do not know zero scores. An example of a Knowledge question was "Can the use of shared tools transmit head lice?" The attitude section consisted of 8 items from completely disagree to completely agree. An example of an attitude question was "Head lice are only common among low-income people?". Behavior was a 5-question section with answer options completely incorrect to completely correct. An example of a question in this section was "I use my personal belongings". Commitment to action was a combination of 5 questions with always-never answer options. An example of an item was "I see a doctor if I have itching or burning in my head". Response options in attitude, behavior, and commitment to action scored 1 to 5 points.

The Ethics Committee of Tarbiat Modares University approved this research. The researcher supervised the completion of the questionnaire. The objectives of the study were explained to the participants during a session at the school. Participants completed the questionnaires under the supervision of researchers. The trained health worker examined head lice infestation in the students and recorded it in the related checklist. The educational program was designed based on pre-test results, which indicated a low level of knowledge, attitude, behavior, commitment to action, and high infestation in students. The first intervention group received designed education. The second intervention group

received designed education along with a commitment to action. The control group underwent a routine program. The intervention consisted of 2 one-hour sessions one week apart, performed by a trained health instructor. The educational content was prepared according to the national guidelines for Pediculosis care [1]. The details of the intervention were described in Table 1. The control group received school routine training on head lice. The knowledge, attitude, practice, commitment to action, and head lice infestation were re-evaluated one month after education.

Table 1) Details of educational sessions on head lice

Sessions	Objectives	A summary of topics and activities
1	To increase knowledge about head lice; To increase attitude toward preventing from Pediculosis Capitis	Programmed lecture about prevalence and complications of Head lice in students, the cycle of Head lice, Modes of transmission, signs, and symptoms applying PowerPoint, video projector, and booklet
2	Promoting Behavior; Increasing commitment to action (in the second experimental group)	Demonstration about Pediculosis Capitis diagnosis, prevention, treatment, and control; Applying Films, pamphlets, and simple messages; Demonstration and discussion about how to committing to behaving in a specific place and time and recording in the table (in the second experimental group)

ANOVA, Kruskal-Wallis, and Chi-square tests were used to compare the variables at baseline. ANCOVA test was applied to evaluate the effect of the intervention on knowledge, attitude, behavior, and commitment to action. Paired t-test was used to compare the variables within each group. Effectiveness of education on head lice infestation rate was assessed by Chi-square. Effective factor on Pediculosis Capitis was determined by logistic regression. The data were analyzed by SPSS 21 at a significance level of less than 5%.

Findings

One hundred fifty students with a mean age of 16.79±0.81 participated. Intervention and control groups did not have significant differences at baseline ($p>0.05$; Table 2).

ANOVA test showed a significant difference between knowledge, attitude, behavior, and commitment to action in three groups at post-intervention. Paired t-test showed a significant difference between the groups at pre and post-intervention (Table 3).

The ANCOVA test was applied to compare the means of variables in the three groups after adjusting covariates (Pre-test). Results showed there was a significant difference between the adjusted means in the groups in the post-test. The effectiveness of the intervention was moderate to high (Table 4). The LSD post hoc test indicated that the second intervention group's behavior and commitment to action significantly differed from the first intervention group ($p<0.05$).

Table 2) Comparison of demographic variables in the groups at baseline (n=150)

Variable	Experimental 1	Experimental 2	Control	
	N (%)	N (%)	N (%)	Sig.
Number of family members				
3	13 (26)	12 (24)	19 (38)	0.440
4	26 (52)	31 (62)	25 (50)	
5	11 (22)	7 (14)	6 (12)	
Number of bedrooms				
1	19 (38)	16 (32)	19 (38)	0.954
2	27 (54)	30 (60)	28 (56)	
3	4 (8)	4 (8)	3 (6)	
Number of people in the bedroom				
1	3 (6)	2 (4)	3 (6)	0.204
2	22 (44)	28 (56)	21 (42)	
3	25 (50)	20 (40)	26 (52)	
Grade				
10	26 (52)	26 (52)	17 (34)	0.162
11	15 (30)	10 (20)	18 (36)	
12	9 (18)	14 (28)	15 (30)	
Father's education				
Under Diploma	13 (26)	15 (30)	7 (14)	0.151
Diploma	22 (44)	23 (46)	25 (50)	
Academic	15 (30)	12 (24)	18 (36)	
Mother's education				
Under Diploma	3 (6)	2 (4)	3 (6)	0.563
Diploma	22 (44)	28 (56)	21 (42)	
Academic	25 (50)	20 (40)	26 (52)	
Father's job				
Free	12 (24)	13 (26)	12 (24)	0.851
Manual worker	17 (34)	19 (38)	19 (38)	
Employee	21(42)	17 (34)	19 (38)	
Unemployed	0	1 (2)	0	
Mother's job				
Housekeeper	25 (50)	25 (50)	32 (64)	0.172
Employed	23 (46)	25 (50)	18 (36)	
Student	2 (4)	0	0	
Residency				
Lease	25 (50)	24 (48)	27 (54)	0.831
Non-lease	25 (50)	26 (52)	23 (46)	
Native				
Yes	40 (80)	40 (80)	34 (68)	0.262
No	10 (20)	10 (20)	16 (32)	
Type of hair				
Curly	33 (66)	33 (66)	34 (68)	0.971
Smooth	17 (34)	17 (34)	16 (32)	
Braided hair				
Yes	9 (18)	9 (18)	10 (20)	0.953
No	41 (82)	41 (82)	40 (80)	
Hair color				
Black	20 (40)	20 (40)	30 (60)	0.244
Brown	23 (46)	23 (46)	16 (32)	
Blond	7 (14)	7 (14)	4 (8)	
Hair size				
Short	8 (16)	3 (6)	3 (6)	0.151
Medium	14 (28)	9 (18)	10 (20)	
Long	28 (56)	38 (76)	37 (74)	
Skin color				
White	21 (42)	21 (42)	21 (42)	0.983
Black	7 (14)	6 (12)	7 (14)	
Brunette and so on	22 (44)	23 (46)	22 (44)	
History of Pediculus				
Yes	45 (90)	47 (94)	40 (80)	0.081
No	5 (10)	3 (6)	10 (20)	
History of Pediculosis in the family				
Yes	47 (94)	48 (96)	49 (98)	0.592
No	3 (6)	2 (4)	1 (2)	

Table 3) Comparison of mean±SD of the knowledge, attitude, behavior, and commitment to action in the groups at before and after the intervention

Variable	Before	After	p-value
Knowledge			
Intervention 1	1.66±0.96	9.32±1.47	<0.001
Intervention 2	1.72±0.96	9.34±0.98	<0.001
Control	1.76±0.96	1.82±0.08	0.083
p-value	0.871	<0.001	
Attitude			
Intervention 1	21.26±2.18	35.44±1.31	<0.001
Intervention 2	21.30±2.67	35.64±0.94	<0.001
Control	21.32±2.10	21.52±2.30	0.067
p-value	0.992	<0.001	
Behavior			
Intervention 1	11.84±1/86	52.19±2.44	<0.001
Intervention 2	12.66±2.28	25.26±1.95	<0.001
Control	12.18±2.43	12.22±2.4	0.159
p-value	0.17	<0.001	
Commitment to action			
Intervention 1	14±2.13	15.1±2.70	0.031
Intervention 2	13.94±2.13	23.28±0.92	<0.001
Control	13.96±2.14	14.1±2.35	0.743
p-value	0.994	<0.001	

Table 4) Effectiveness of educational intervention on variables in the groups

Variable	Mean Square	df	F	Sig.	Partial Eta Squared
Knowledge (Pre-education)	14.244	1	10.989	0.001	0.071
Group	944.469	2	728.689	<0.001	0.920
Attitude (Pre-education)	55.24	1	24.216	<0.001	0.140
Group	3281.15	2	1438.26	<0.001	0.953
Behavior (Pre-education)	180.77	1	45.20	<0.001	0.235
Group	2054.46	2	513.75	<0.001	0.871
Commitment to action (Pre-education)	2.03	1	0.444	0.5	0.003
Group	1268.70	2	276.03	<0.001	0.793

Dependent variable: Knowledge, Attitude, Behavior, Commitment to action (Post-education)

The Chi-square test indicated that the percentage of Pediculosis in students in two intervention and control groups was significant at post-intervention (p<0.001). Also, the second intervention group had a significant difference from the first intervention group (p<0.05) (Table 5).

Table 5) Comparison of head pediculosis between intervention and control groups at pre and post-intervention

Pediculosis Capitis		Baseline N (%)	After intervention N (%)
Intervention 1	Yes	22 (34.9)	10 (30.3)
	No	28 (32.2)	40 (34.2)
Intervention 2	Yes	20 (31.7)	2 (6.1)
	No	30 (34.5)	48 (41.0)
control	Yes	21 (33.3)	21 (63.6)
	No	29 (33.3)	29 (24.8)
Sig.	-	0.92	<0.001

Logistic regression results showed that Head lice infestation increased with increasing the number of family members, the number of those in the bedroom, and history of infection. Also, this infestation decreased with more knowledge, attitude, behavior, commitment to action, and bedrooms in students (Table 6).

Table 6) Results of logistic regression model for variables affecting Pediculosis

Variable	Beta coefficient	Wald statistics	EXP (B)
Number of family members	2.929	49.246	18.707
Number of people in the bedroom	4.689	58.942	108.717
Number of bedrooms	-4.023	53.370	0.018
Family history	4.101	63.072	60.417
Person's history	0.384	35.569	9.861
Knowledge	-0.850	26.189	0.427
Attitude	-0.598	44.515	0.550
Behavior	-0.939	49.604	0.391
Commitment to action	-0.910	51.705	0.403

Dependent variable: Head pediculosis; df=1; p<0.001

Discussion

The educational intervention with moderate to large effect size promoted knowledge, attitude, behavior, commitment to action, and reduced head lice infestation in female high school students. There was a significant difference between knowledge, attitude, behavior, and head lice infestation in intervention groups at post-test, consistent with the study of Yingklang [4] and Gholamnia *et al*. [10]. It seems that the use of educational material and intervention has a positive effect. The demonstration and planned lecture (which is a combination of lecture, discussion and colloquy) have raised students' awareness, attitude and behavior. The increased behavior and commitment to action and decreased head lice infestation in the second intervention group (education and commitment) were significantly different from the first intervention group. Applying commitment to action led to increasing the effectiveness of the educational intervention. This construct created a commitment to perform the behavior, resulting in a reduction in the infestation. Khodaveisi *et al*. study showed that educational intervention based on the Pender Health Promotion Model on nutritional behavior increased women's health-promoting lifestyle scores. Totally 82% of women's nutritional behavior was predicted by perceived barriers, positive feelings related to behavior, perceived self-efficacy and commitment to action [11]. Mohammadipour *et al*. education based on Pender Health Promotion Model promoted nutritional behavior and stress management in diabetic patients. Totally 42.2% of behavior was predicted by the model. Commitment to action and self-efficacy were the strongest predictors [12]. Defining specific strategies to motivate, perform, and reinforce behavior is essential. Commitment to a program initiates a behavioral event and can lead people to behave. The greater the commitment to a specific action plan, the more likely health-promoting behaviors will continue over time [13].

With increasing the number of family members, the number of those in the bedroom, history of infection,

and a reduction in the number of bedrooms, knowledge, attitude, behavior, and commitment to action, the incidence of Pediculosis Capitis in students increased. Increasing the prevalence of Pediculosis with increasing the number of family members and the number of people in the bedroom is in line with Takano *et al*. and Canyon *et al*. studies [14, 15]. The larger the family population, the fewer parents can take care of their health. In large families, the infection increases due to close contact between people and shared equipment. The study of Saghafipour *et al*. [16] and Rafiee *et al*. [2] showed a non-significant relationship between the number of people and infestation. This may be due to the socioeconomic and cultural differences of the target group. In cities with higher socioeconomic status than in rural areas, children sleep in private rooms apart from other family members and do not share beds and utensils. Too many people in bedrooms increase Pediculosis. The more bedrooms and the fewer people sleeping in a room, the less contact there is between people and the less infestation there is. These results are consistent with the study of Moosazadeh *et al*. [5] and Gholamnia *et al*. [10]. Infection rates were higher in students with a history of head lice infection. It may be due to the presence of some lice eggs in a person's hair. There may also be a source of disease transmission in the family and relatives of the person. This finding is consistent with the study of Mohammadnejad [17], Al-Maktari [18] and Moshki *et al*. [19]. Students with infected families have a higher rate of infection. Soleimani *et al*. Confirmed this finding by examining the epidemiological aspects of head lice in Qeshm students [20]. Because contamination is transmitted through direct contact and sharing contaminated equipment and clothing, infected family members increase the likelihood of students becoming infected. Decreased awareness, attitude, practice, and commitment to action significantly increase head lice infestation. This finding is consistent with the research of Pourbaba *et al*. [21], Gholamnia *et al.* [10], Zareban *et al*. [22] and Haghi *et al*. [23]. Adequate knowledge, a favorable attitude and appropriate behavior and commitment to action in the prevention and control of head lice reduce the risk of infection.

This study showed the effect of commitment to action structure in increasing the effectiveness of the educational intervention on head lice infection control. However, this study had limitation as short after intervention time and lack of behavioral maintenance evaluation. It is suggested that future studies based on this structure be performed to prevent and control other parasitic infections in students.

Conclusion

The effectiveness of the educational program on promoting knowledge, attitude, and behavior and Pediculosis Capitis control in female high school students is increased using the structure of commitment to action. These findings can be considered in designing interventions to prevent Head lice in students.

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