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

**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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*Citation Links*

[1] Pediculosis humanus capitis prevalence as a health problem in girls. [2] Epidemiology of pediculus humanus capitis infestation and effective factors. [3] Evaluating the effectiveness of the construct of commitment to action on... [4] Effect of a health education program on reduction of Pediculosis in school girls. [5] Prevalence of head lice infestation and its associated factors among primary school. [6] Theoretical foundations of health education. [7] Efficacy of peer education for adopting preventive behaviors against head lice infestation in female elementary. [8] The role of correlated factors based on Pender health promotion model in... [9] Health promotion in nursing. [10] Evaluation of a health education program for head lice infestation in... [11] Dietary behavior status and its predictors based on the pender's health model. [12] The impact of an educational intervention based on Pender's health promotion model. [13] Determinants of oral health behavior among high school students in Marivan county, Iran. [14] Transmission potential of the human head louse. [15] Spatial and kinetic factors for the transfer of head lice. [16] The epidemiology of Pediculus is humanus capitis infestation and... [17] The prevalence of pediculosis capitis and its associated risk factors in primary. [18] Head louse infestations in Yemen: Prevalence and risk factors. [19] Preventive behaviors of female elementary students. [20] The epidemiological aspect of Pediculus in primary school. [21] A survey of prevalence of Pediculosis among primary school. [22] Evaluating a health-education program in order to reduce... [23] Epidemiology of Pediculus and its associated risk...
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. The prevalence of pediculosis capitis is reported at 6% and 30% in different parts of Iran. Also, hundreds of thousands of people are newly infected with this parasite each year. Head lice prevalence has been reported to be 8.8% in female girl school students. Girls are more likely to be affected than boys, and schoolchildren are more likely to be infected than adults. 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. 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. Pender's Health Promotion Model has been used as a framework for planning interventions to improve healthy 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. Due to the high prevalence of Pediculosis in students, school-based health education effectively prevents and controls head lice. Pender's Health Promotion Model has been used as a framework for planning interventions to improve healthy behaviors. 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. 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.

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 1 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.

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 among the 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 | 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) |      |
| Lung                      | 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           | 22 (44)       | 25 (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)   |      |
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| 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    | 21.2±2.18    | 35.4±1.31      | <0.001  |
| Intervention 2    | 21.3±2.67    | 35.6±0.94      | <0.001  |
| Control           | 21.3±2.10    | 21.5±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         |         |

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            | -0.050           | 26.189          | 0.427   |
| Attitude             | -0.598           | 44.515          | 0.550   |
| Behavior             | -0.939           | 49.604          | 0.391   |
| Commitment to action | -0.091           | 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. Soleiman 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 Hagh 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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**Conflicts of Interests:** Authors have no conflicts of interest to declare.

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