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THE EFFECTIVENESS OF OPTIMIZING WATER CONSUMPTIONS EDUCATIONAL PROGRAM IN PROMOTING THE KNOWLEDGE AND ATTITUDE LEVEL OF STUDENTS

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Abstract

Fresh water deficiency is a global issue and the world rushed with fear to the water deficiency disaster and its related problems. Therefore, the aim of this study is to evaluate the effect of education on changing the knowledge and attitude level of students in high schools in terms of optimizing the water consumption pattern. This is a descriptive-analytical study. The studied populations include the high school students of Kermanshah city in 2012. The participants were 840 people (420 boys and 420 girls) which selected by multistage cluster method. In before test stage the individual of both groups answered the knowledge and attitude questionnaire simultaneously. At the next stage only case group have educated in 16 sessions for 50 minute. After the educational session both groups examined again simultaneously after the test and following up by the mentioned questionnaire. For analyzing the data the SPSS software and Variances analysis, Covariance analysis and T-test have used for dependent and independent group. The results showed that there was a significant difference between the before and after test knowledge and attitude of both case and control groups ($P < 0.05$). The adjusted scores average of the knowledge in case group (11.5) was more than the control group (5). In addition, the adjusted scores average of attitude in case group (56.53) was more than the control group (39.5). Generally, it could have concluded that the education could increase the knowledge and attitude level of students in terms of reforming the water consumption pattern.

Keywords: Education, Knowledge, Attitude, Water consumption pattern, Students.

Introduction

Fresh water deficiency is a global issue and the world is rush with fear to the water deficiency disaster and its related problems. Today because of many reasons, more utilization of water resources is an undeniable necessity(1-3). The rapid growth of population, lack of uniform distribution of precipitation in the world, rainfall deficiency in most part of the world are the factors, which caused water deficiency. The other factors are urbanization and the increase of the water consumption per capita along with cultural, social, and economic situation development. The increase of the sewage production and more water resources contamination, undesirable quality of water and over exploitation, reducing the water quality lack of reusing the water, poor culture of using water and as results of water reduction of water per capita are some other factors that caused water deficiency issue. In addition, there is a possibility for drought phenomenon incidence as a main problem in international and national level. Our country Iran is a vast country with different and dry climate, which the people of vast region in it always suffered from water deficiency (4-7). Annually some part of water resources in the country have waste because of the cheapness and lack of accuracy in consumption. This resulted in the fact that, in addition to reducing this God-given resource, it caused the increase of the pollution, heavy expansion of extraction, production, and water transmission. Its results was lack of accessibility to the determined goals in 20 years view of the country development (8). For this reason, reforming water consumption pattern, as an undeniable necessity should considered for more attention. The important strategies for saving and protecting the present water resources, are optimizing the consumption pattern, proper education and institutionalizing the value and importance of water in society. Water consumption in different countries was depending on the cultures and traditions of that country's people is different. One of the least expensive, most durable and cost-effectiveness methods of unnecessary consumption increased prevention, or in other words optimizing the energy consumption is knowledge and energy consumption management education. It should have considered that if the people have knowledge, in some cases they have choosing power to follow the proper consumption pattern. The united nation in 2005 approved a law, which according to the educational system, in addition to the fact that is a part of human right; it is a necessary condition for achieving the stable development and necessary tools for a good government and an awareness decision and democracy promotion.

Therefore, the educational system is for more adaption with the environment and promotion of capacity development in individuals for a companying by natural resources protection. The evidences showed that all the students and teachers should have familiar with the concept and methods of environmental protection as a formal part of education

system (9). The increase of youth's knowledge level in this field was resulted in getting rid of the present condition and make a situation for creating responsibility among the consumers about the energy. Esmi showed that educating the reform of the consumption pattern through TV could cause positive behavioral changes in kids and teenagers (10, 11). Because the knowledge about energy is form during the childhood, the schools have an important role in the successfulness of this field. However, the kids are more ready to learn new concepts and they acts as educational factors, considered as a leader of this subject in home, and grows the citizen's knowledge about the environment (12-14).

Now in the beginning of the fourth decade of Islamic revolution with the improvement and justice slogan, there is a need for reforming consumption pattern more than the past for achieving the justice and improvement, a reform that could have an important role in creating justice and improvement of the country. Therefore, the aim of this study is evaluating the effectiveness of optimizing water consumption patterns educational program in promoting the knowledge and attitude level of students.

Methods

This is a descriptive-analytical study with the before and after test design and control group. The statistical population in this study is all the high school students of Kermanshah city in 2012, which this population includes 840 students (420 boy and 420 girls) which selected by multistage cluster method in three region of Kermanshah and divided in two groups of case and control by simple random method. In the present stage, the participants of both groups answered the knowledge and attitude questionnaire simultaneously. In the next stage, only the case control group have educated in 16 sessions for 50 minute. After the end of the educational sessions both groups simultaneously after the test and following session (after one month) have examined by the mentioned questionnaire again. For analyzing the data the SPSS 16 software, Variance analysis, Covariance analysis and T-test have used for the dependent and independent groups. In this research for preparing the required raw data, the questionnaire with 30 questions have used which the questions are consistent with the project goal and regulated in a way that the students transferred the real answer of their mind and the answer of the questions were in the field of students' knowledge and information. The knowledge questionnaire include 13 questions with four choices and each questionnaire have 1 correct answer and at least 13 score and the attitude questionnaire include 17 questions with four score through Likert scale and at least 68 scores. The Cranach's alpha reliability coefficient of the questionnaire were 81.7 and 64.5 for knowledge and attitude questionnaire respectively.

Results and Discussion

Overall, 840 participants students answered the research questionnaire of the study completely. These individuals have the mean year of 16 age and the age range of 15-18. Among these participant 420 persons were boys and 420 girls, who for this number 390 people(44.4%) and 450 person (51.6%) formed the case and control group respectively. The results of the knowledge and attitude measurements by Covariance analysis showed that there was a significant difference between the after test scores of two case and control group ($P < 0.05$) (table1).

Table-1: Summary of variance analysis for scores of knowledge and attitude.

Variables	Source changes	Sum of square	df	Average of square	F _{value}	P
Knowledge	Group	6525.41	1	6525.41	68.86	0.005
	Error	551.89	837	0.65	-	
	Total	-	840	-	-	
Attitude	Group	3064.44	1	3064.44	260.512	0.005
	Error	9833.99	837	11.76	-	
	Total	-	840	-	-	

In addition, the adjusted score average of knowledge in case group (11.15) was more than the control group (5). In addition, the adjusted score average of attitude in case group (56.53) was more than the control group (35.9).

The results of the independent T-test showed that, there was a significant difference between the after test score average of knowledge and attitude in girls and boys of case and control groups ($P < 0.05$) (table2).

Table-2: T test for independent groups of boys and girls.

Variables	Tests	t	df	The difference of standard error	P
Knowledge	Pre test	4.24	838	0.77	0.005
Attitude	Post test	1.57	838	0.22	0.005
	Pre test	6.75	838	0.34	0.005
	Post test	5.07	838	0.79	0.005

The results of the T-test for dependent group showed that, there was a significant difference between the score average of the knowledge before and after test for both case and control group except the girl and boys control group ($P = 0.20$). Also in attitude level only in girls and boys case group there was a significant difference (table3).

The results of the variance analysis test showed that there was a significant difference between knowledge score before the test and following both case and control group ($P=0.005$, $F_{(2,1676)}=7.19$). In other words the knowledge score after the education of the reforming consumption pattern have increased after the test and at the following stage these increasing trends remain.

Table-3: T test for dependent groups.

Variables	Group	Sex	t	df	Standard error	P
Knowledge	Case	Boy	70.42	194	1.09	0.002
	Control	Boy	7.06	209	0.79	0.002
	Case	Girl	79.84	194	1.05	0.002
	Control	Girl	1.27	209	0.41	0.20
Attitude	Case	Boy	53.84	194	0.34	0.002
	Control	Boy	0.87	224	0.79	0.93
	Case	Girl	84.41	194	0.26	0.002
	Control	Girl	1.61	224	0.21	0.10

Also the results of the repeated variance analysis test showed that there was a significant difference between the cases attitude score before test and following stage of both case and control group ($P=0.005$, $F_{(2,1676)}=6.91$). In other words the attitude score after the education of reforming consumption pattern after the test have an increasing trend and at the following stage this increasing trend have remain (table4).

Table-4: Repeated measures analysis of variance to compare mean scores of knowledge and attitude in both case and control groups in the pre-test, post-test and follow-up.

Variables	Group	Pre test		Post Test		Fallow up		$F_{(2,1676)}$ time	Effe ct size	P	
		Mea n	SD	Mea n	SD	Mea n	SD			Time	Time & group
	Control	4.77	1.05	5	1.01	4.80	1.03				
	Total	5.04	1.12	7.85	3.24	7.69	3.08				
Attitude	Case	36.20	5.29	56.53	6.02	56.06	5.89	6.91	0.88	0.005	0.005
	Control	35.7	5.07	35.9	5.35	33.8	4.77				

		2		0		5					
	Total	35.9	5.18	45.4	11.7	45.2	11.5				
		4		8	5	6	1				

According to the results of the present study it could have concluded that education caused the increased of the knowledge and attitude level in students of Kermanshah in terms of the reforming the consumption pattern. The results are consistent with Sadeghi (2009) (15) about the information technology role in reforming the consumption pattern. The study of Zografakis et al. (2007) (16) showed that using the information program of energy saving and educational projects and its important role in various educational level and its effect on the increase of the positive behavior changes in terms of optimizing the consumption patterns and caused the reduction of energy wasting. Also based on the Nazari, Ahmadloo, TaravatiFakoor (2009) (17) study results, the education of water consumption management by TQM methods could have improved the consumption pattern and water per capita reduction in elementary schools of Markazi province.

Moosae (2009) (18) study showed that the most important issue for changing the consumption pattern is culture. For this goal using the organization such as family, schools, university and Medias which the main function of them is creating desirable culture and transforming it, should considered as priority. Rabieand Mohebi Amin (2009) (19) study showed that the reforming consumption pattern culture should begin at kindergarten and institutionalized in kids and teachers make the kids, teenagers and youths familiar with resources limitation along with educating the proper consumption. For this reason, one of the ways of disseminating the reforming consumption culture is putting this subject in journals and educational books.

Conclusion

According to the more use of pattern by the youth and teenagers, its better to begin the reforming consumption pattern at the educational places such as schools and For promoting the reforming consumption pattern , undoubtedly, the first step is school.

Educating this art in school not only is not a wasting time but also is an important act for unique education, because schools after the family are the second educational place for kids and teenagers. Therefore, by promoting the reforming consumption pattern ways, this important goal could have achieved in schools.

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Resources

1. DarvishMotevalli M, JaliliNaghan D, Mirzaei N, Haghighi S A, Hosseini Z, Sharafi H, Sharafi K. The reusing feasibility of wastewater treatment plant (conventional activated sludge) effluent of tomato paste factory for agricultural irrigation - a case study. *International Journal of Pharmacy & Technology*. 2015; 7(3): 9672-9679.
2. Mirzaei N, Ghaffari H R, Karimyan K, MohammadiMoghadam F, Javid A, K Sharafi K. Survey of effective parameters (water sources, seasonal variation and residual chlorine) on presence of thermotolerant coliforms bacteria in different drinking water resources. *International Journal of Pharmacy & Technology*. 2015; 7(3): 9680-9689.
3. Haghighi S A, Mansourin N, Mirzaei N, AziziNahid, Hosseinei Z, Sharafi H, Sharafi K. Survey of corrosion and silting potential in drinking water of urban distribution system during one year period a case study. *International Journal of Pharmacy & Technology*. 2015; 7(3): 9701-9708.
4. Pirsahab M, Khosravi T, Sharafi K, Babajani L, Rezaei M. Measurement of Heavy Metals Concentration in Drinking Water from Source to Consumption Site in Kermanshah—Iran. *World Applied Sciences Journal*. 2013; 21(3):416-23.
5. Pirsahab M, Khosravi T, Sharafi K, Mouradi M. Comparing operational cost and performance evaluation of electro dialysis and reverse osmosis systems in nitrate removal from drinking water in Golshahr, Mashhad. *Desalination and Water Treatment*. 2016; 57(1): 5391–5397.
6. Pirsahab M, Moradi M, Ghaffari H R, Sharafi K. Application of response surface methodology for efficiency analysis of strong non-selective ion exchange resin column (a 400 e) in nitrate removal from groundwater. *International Journal of Pharmacy & Technology*. 2016; 8(1): 11023-11034.
7. Soltanian M, Dargahi A, Asadi F, Ivani A, Setareh P, saleh E. Variation of PhysicoChemical Quality of Groundwater Watershed in Gharehsou during 2003-2012. *J Mazandaran Univ Med Sci*. 2015; 24 (121) :275-287.
8. Pirsahab M, Dargahi A, Khamutian R, Asadi F, Atafar Z. A Survey of Methyl Tertiary Butyl Ether Concentration in Water Resources and Its Control procedures. *J Mazandaran Univ Med Sci*. 2014; 24 (113) :119-128.
9. Jennings P, Lund C. Renewable energy education for sustainable development, *Renewable Energy*. 2008; 8 (36): 3226-3232.
10. Dias RA, Mattos CR, Balestieri JAP. Energy education: breaking up the rational energy use barriers. *Energy Policy*. 2004; 11 (32):1339 to 1347.

11. Pirsahab M, Sharafi K, Karami A, Dargahi A, Ejraei A. Evaluating and assessing the coagulants (poly aluminum chloride, ferrous sulfate, ferric chloride and aluminum sulfate) efficiency in removing the turbidity from aqueous solutions. *International Journal of Pharmacy & Technology*.2016; 8(2): 13168-13181.
12. Tabandeh L, Shams khorramabadi Gh, Karami A, Atafar Z, Sharafi H, Dargahi A, Amirian F. Evaluation of heavy metal contamination and scaling and corrosion potential in drinking water resources in nurabad city of lorestan, iran. *International Journal Of Pharmacy & Technology*. 2016;8(2): 13137-13154.
13. Pirsahab M, Dargahi A, Hazrati S, Fazlzadehdavil M. Removal of diazinon and 2, 4-dichlorophenoxyacetic acid (2, 4-D) from aqueous solutions by granular-activated carbon. *Desalination and Water Treatment*. 2014;52(22-24):4350-5.
14. Dargahi A, Pirsahab M, Hazrati S, Fazlzadehdavil M, Khamutian R, Amirian T. Evaluating efficiency of H₂O₂ on removal of organic matter from drinking water. *Desalination and Water Treatment*. 2015; 54 (6): 1589-1593
15. Sadeghi day. The role of information technology in reforming consumption patterns (with an emphasis on communication tools). *Journal development strategy*.2009; 7 (20): 118-143.
16. Zografakis N, Dasenakis D, Katantonaki M, Kalitsounakis K, Paraskaki I. Strengthening of energy education in Crete. In *Proceedings of SECOTOX Conference and the International Conference on Environmental Management, Engineering, Planning and Economics, Skiathos*. 2007: 24-28.
17. Nazari M, Ahmadlou A. Taravati Fakour Z. The impact of training on water consumption management by TQM method to improving consumption patterns and reducing per capita water in urban elementary schools in Markazi Province. 3rd National Conference on Water and Wastewater operation approach, University of Power and Water Industry, Water and Wastewater Engineering Company. Tehran, 2009.
18. Moosae. The role of culture on consumption patterns. *Journal of Islamic economics*. 2009, 9 (34): 125-150
19. Rabie M and Mohebi Amin S. Structured content analysis of primary school textbooks in terms of consumption patterns (with emphasis on the Quran and Hadith). 2009, 5 (16): 113-142.

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