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Mediating Role of Self-efficacy of Students in the Relationship between Problem solving Skills and Managing Drinking Water Consumption

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Fatemeh Mahzounzadeh Bushehri
Department of Educational Sciences, Payame Noor University, PO BOX 19395-3697 Tehran, IRAN
*Corresponding author: Mahzounzadeh Bushehri F.

Abstract This study aimed to determine the relationship between problem solving and managing water consumption through the mediation of efficacy. Research based on the purpose is an applied research and due to the method was descriptive and correlational. The population includes high school students in 2015-2016 in Bushehr. In this study, using multi-stage cluster sampling method and sample size was calculated 244 using Cochran formula. The findings suggest that the causal model given in good brush and a total of variables can be explained 59 percent of variance in the management of drinking water. The results showed that problem-solving skills in addition to the direct impact, indirectly through self-management also affects water consumption by students.

Keywords: self-efficacy, water consumption management, problem-solving skills.

Introduction

Seventy percent of the Earth's surface is taken by the water and less than one percent of it has the usability for the life that the figure is also unevenly distributed and is of great scarcity in many countries. The studies showed that by 2030, the need for water on the planet will increase by 40% (Chitchian, 2016). For this reason, according to the water resources per capita consumption, about 25 percent of the world including Iran, in 2025, will face with the physical shortage of water. Iran is geographically located in the arid and semi-arid regions, and the average rainfall is 250 mm to 243 mm that this figure is one third of the average rainfall in the world. That's why Iran is for several years grappling with the phenomenon of drought. Significant number of serious changes in the country's climate change and the average temperature rise of around two degrees Celsius also evaporate more water sources as well. Unfortunately, the province of Bushehr ranked second among the provinces in terms of drought and the volume of rainfall in the country ranked thirtieth (Bassetti, 2015). There's no doubt that water resources are declining and are scarce, but it seems that the real issue is not the gradual shrinking water resources rather than waste water mismanagement is the main issue (Ostovari, 2016). More than 92 percent of drinking water of Bushehr Province is provided from neighboring provinces of Fars and Kohgiluyeh and Boyer Ahmad and only 8 percent is provided by the province's groundwater resources. Yakydeh (2016) CEO of Water and Wastewater Organization of Bushehr stated that given the critical situation of water in the province, in order to pass the crisis and water stress in the province is mostly caused by high consumption management culture should use common agenda.

Reforming consumption patterns is a national mission and requires a national commitment. Education should be in the spotlight as the most fundamental

institution in establishing and changing social, economic and moral attitudes. This educational institution given access to the large student population, family and teachers, is the most prepared ground to guide individual behavior and litter in order to collectively manage water consumption in society. The entity can make corrections and changes in its various aspects, the correct usage of education pattern strengthen and promote the understanding. The broad community of students play an important role in promoting the culture, habits, behavior and attitudes are correct water use at the national level. Obviously, if the correct water use practices of early education, is institutionalized within the students, the next generation will have made good progress.

Bandura (1997) knows believing the efficiency as an important factor in human merit system, and believes that a sense of self-efficacy enables people to use the skills in dealing with obstacles, do extraordinary things. Therefore, self-efficacy is an important factor for successful performance and basic skills necessary to do so (Shang and Pajars, 2002). Efficient people are working on events that affect their lives, they exercised control. The ability to influence outcomes, and makes them predictable prepared to raise orientation. This can be provide countless personal and social interests for them (Pajaryz, 2002). In this context, Mahzoonzadeg, Arefzadeh and Ghaltash (2016) conducted a research and have pointed to the role of the media, citizens and efficacy, their attitude to the economy of resistance, water management and came to the conclusion that these factors can affect the management of water consumption by citizens. This is where the importance of addressing the efficacy of the current critical situation, believing in their capabilities, enables students in dealing with environmental challenges with the help of a special life skills of problem solving skills, do extraordinary things. Problem solving skill is a useful tool for tackling off, and for behavioral or cognitive process, provides a variety of potential effective answers for problematic situations and increases the probability of selecting the most effective response to these various solutions (Haaga et al., 1995). Problem solving and creativity are at the highest level of human cognitive activity, and are considered the most valuable educational goals. The goal of all educational institutions and training activities and capacity building skills in problem solving, because only through this ability is that the ability of people can cope with changing circumstances and situations the new life he (Saif, 2015).

Sharifi and Rahmati (2013) in their study showed that self-efficacy of the students increased significantly after the education note-taking skills. The results by Yousefzadeh et al. (2012) showed that metacognitive skills training increases the students' self-efficacy. Zahrakar, Rezazadeh and Ghodsi Ahghar (2010); Fesharaki, Eslami, Moghimian, and Azarbarzin (2010); Yousefi, Gharazi and Gordanshekan (2012) in their study showed that training significantly increases the efficacy of the problem solving method.

Since high self-efficacy is creating a

sense of empowerment in solving problems, it seems to be able to develop a sense of self-efficacy in students' problem-solving skills, has an effective role to solve the problem of drinking water in the city of Bushehr. Due to the fact that research has not been done to examine the role of self-efficacy as a mediator in the relationship between problem-solving skills to manage water consumption, the study seeks to answer the question whether the students' self-efficacy can play a mediating role in the relationship between problem-solving skills to manage water consumption? Accordingly, the following research hypothesis is as follows:

Hypothesis: Self-efficacy works as a mediator between students' problem solving skills with the management of drinking water.

Methodology

The study aims to examine the relationship between problem-solving skills to manage water consumption through mediating role of efficacy.

Objective: applied and the data collection method was descriptive and correlational.

The population: The population was high school students in Bushehr in 2015-2016.

Sampling: multi-stage cluster.

Sample size: 244 people were estimated using Cochran formula.

Research Tools:

A) self-efficacy questionnaire: the self-efficacy questionnaire by Mahzoonzadeh, Arefzadeh and Ghaltash (2016) was developed to gauge respondents' perceived self-efficacy citizens in the area of domestic drinking water use. This is a questionnaire with 9 items and is examined on a five-point spectrum. The reliability through Cronbach's alpha coefficient was 0/78. Validity of the test was confirmed by test makers using factor analysis.

B) Inventory of drinking water management: Inventory of water consumption management by Mahzoonzade, Arefzadeh and Ghaltash (2015) was developed to gauge respondents' understanding of the behavior of domestic drinking water use. The questionnaire has 12 items on a five-point spectrum is examined. The reliability through Cronbach's alpha coefficient was 0/73. Validity of the test by manufacturers was confirmed using exploratory factor analysis.

C) problem-solving questionnaire: the questionnaire by Hepner and Petersun (1982) was developed to gauge respondents' understanding of the behavior of matter and problem solving and has 35 choices that is examined in a five-point spectrum. By calculating Cronbach's alpha coefficient of reliability vary from 850 respectively. Validity of the test by test makers have been reported within acceptable limits.

Results

The realization of structural equation models were used to examine the relationship between variables. Amos-21 was used to test the hypothesized model of the software.

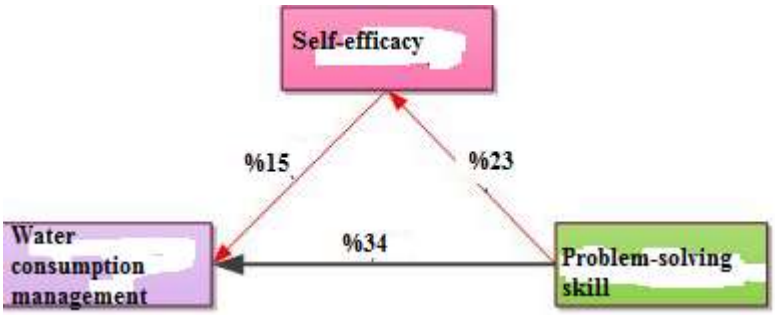

Fig. 1. path analysis modeling for water management

Table 1. Correlation matrix of variables

Variables		1	2	3
Managing water consumption	Correlation coefficient	1		
	Significant level			
Self-efficacy	Correlation coefficient	**0.42	1	
	Significant level	0.001		
Problem-solving skills	Correlation coefficient	**0.74	**0.31	1
	Significant level	0.001	0.001	

Table 2. Indices of model fitting

Fitting indices	Domain of acceptance	Calculated value
Chi Square (df/χ^{r})	≤3	0.001
Comparative fit index (CFI)	≥0.9	1
Goodness of fit index (GFI)	≥0.9	1

Table 3. Structural path analysis model

		Estimate	S.E	C.R.	P-Value
Problem Solving ←	Self-efficacy	0.226	0.044	5.117	0.001
Problem Solving ←	Water consumption management	0.340	0.022	15.22	0.001
Self-efficacy ←	Water consumption management	0.147	0.030	4.884	0.001

Results in the table showed that all the paths were significant in 0.001 level.

Table 4. Calculation of direct and indirect effects of all variables

	Self-efficacy			Drinking water consumption management		
	Direct	Indirect	Total	Direct	Indirect	Total
Self-efficacy	0.00	0.00	0.00	0.212	0.000	0.212
Problem-solving	0.31	0.00	0.31	0.67	0.066	0.74
Explained variance		0.10			0.59	

To calculate the effect of structural paths suggests that problem-solving skills directly (0.67) and indirectly (0.066) and total (0.74) has had an impact on the management of water consumption, the impact factor of self-efficacy on managing water consumption the place was 0/21. The effects of problem-solving skills

directly on the efficacy was 0.31. R^2 shows that 10% of the variance of efficacy by 59% of water consumption management can be explained by the variance of problem solving and problem-solving skills and self-efficacy. In order to study the significance of indirect factors Bootstrap procedure was used to select 5,000 samples, the results showed that indirect effect on the drinking water problem was significant in the 02/0> P. So the relationship between self-efficacy and problem solving skills is partial mediating role to manage water consumption.

Discussion & Conclusion

The results showed that self-efficacy plays a minor mediating role in the relationship between problem solving skills and the managing water consumption. In other words, self-efficacy and problem-solving skills are directly and indirectly related by managing water use. Several studies have been done on the importance of educating self-efficacy and problem-solving skills suggest that teaching problem solving skills, is a strategy to increase the self-efficacy. In this respect, the investigations done are: Yousefi, Gharazi and Gordanshekan (2012); Yousefzadeh et al. (2012); Fesharaki, Eslami, Moghimian and Azarbarzin (2010); Arabzadeh, Kadiwar and Delawar (2014); Sharifi and Rahmati (2013); Zahrakar, Rezazadeh and Ghodsi Ahghar (2010). In explaining this, can cite Shour (2000). According to Shour, the performance of students who are able to solve the problem is better than the other students. The emphasis is on problem-solving orientation, explaining the problem, propose solutions and make correct decisions among existing solutions increase students' performance and the ability increases to control and manage them on the complex issues of living.

We can rely on Bandura's theory in explaining the relationship between self-efficacy and management of drinking water. Bandura (2000) knows self-efficacy as judgments and individual beliefs in their abilities to perform the duties and responsibilities that are activated through processing skills cognitive, motivational and emotional responsible for the transfer of knowledge and abilities are skillful behavior. People with high self-efficacy are aware of their strengths and weaknesses, they will choose realistic goals, and your expectations are reasonable, and the advantages of the deal focused on the problem, Are aware of the emotion-focused coping. People with high self-efficacy else dared to possess, social and high self-esteem, as well as greater control over their lives, the features are considered as the tools to identify and solve challenges like the current water crisis. Mahzoonzadeh et al. (2016) in his study cited the relationship between self-citizens management with drinking water.

In conclusion of the main hypothesis, it can be said that life skills workshops and special workshops and problem solving skills using the techniques of problem solving skills with an emphasis on teaching proper consumption patterns of drinking water, can support a sense of competence and mastery and have an important role in raising students self-efficacy. Accordingly, we can say that students who have high self-efficacy, will consider the water crisis as a problem of social threats and economic, cultural challenges and a threat in the preparation of drinking water that should dominate over them, the people with the skills and strategies necessary are more deeply involved in the activities and do not have time on trying to fix it. Students in a spirit of self-efficacy, that "I can and I will be able to solve drinking water problems" would be the correct way to manage the water consumption and while overcoming the problems caused by this crisis, also

take steps to reduce per capita water consumption as the economic and social costs, such as health problems, ethnic and tribal conflicts, and avoid dependence on drinking water supply of neighboring provinces.

Recommendations

Design and editing of books and pamphlets of specialized course on the correct use and optimization of drinking water by program planners, and education. School planning to visit the students of water utilities in the form of field trips. In the area of education means practical and efficient water use can be carried out the following activities in schools include: the choir, making banners and install it in a school setting, holding theaters period, competitions, painting and crafts and poetry editors and wallpaper .

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