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Water Crisis and Education: The Role of Moral Norms and Perceived Behavioral Control in Students' Water Consumption Behavior

Zahra Pazokinejad[1], *Sadegh Salehi[2], Ali Asgar Firoozjayan[3], Hossein Sharifpour[4]

1. Post-doctoral Researcher in the Department of Sociology of Development, Faculty of Social Science & Humanities, Mazandaran University, Babolsar, Iran. Teacher of Social Studies of Qauemshahr city
2. Professor of Environmental Sociology, Department of Sociology of Development, Faculty of Social Science & Humanities, Mazandaran University, Babolsar, Iran
3. Associate professor of Social Problems, Department of Sociology of Development, Faculty off Social Science & Humanities, Mazandaran University, Babolsar, Iran
4. Assistant Professor of Crime Prevention Management, Faculty of Command and police management, Amin comprehensive university of police science, Tehran, Iran

Correspondence:
Sadegh Salehi
Email: s.salehi@umz.ac.ir

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ABSTRACT

Among different social sectors, students are one of the most important social groups targeted by environmental education. The purpose of this study is to investigate the social factors affecting students' water consumption behavior. The basic research questions were: 1. What is the water consumption level of students? 2. What are the social factors affecting students' water consumption behavior? In terms of methodology, the present research was conducted using a survey method at the first secondary level in girls' schools in Babol city, Mazandaran province, during the spring of 2024. One hundred students were selected as the statistical sample, and a questionnaire was used to collect the required data. The data obtained from the research were described and analyzed using SPSS. The findings of the study showed that the average water consumption behavior of students is at a moderate level. Spearman's correlation analysis confirmed a statistical relationship between the number of family members and water consumption behavior. According to the results of the ANOVA test, there was no significant difference in water consumption behavior based on educational level. The results, based on regression coefficients, showed that perceived moral norms and behavioral control have the greatest impact on students' water consumption behavior. Based on the findings, suggestions were made to strengthen moral norms and increase awareness of the consequences.

KEYWORDS

Moral Norm, Mazandaran Province, Perceived Behavioral Control, Students, Water Consumption Behavior.

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نقش هنجارهای اخلاقی و کنترل رفتاری درک‌شده در رفتار مصرف آب دانش‌آموزان

زهرا پازوکی نژاد [۱]، *صادق صالحی [۲]، علی‌اصغر فیروزجائیان [۳]، حسین شریف پور [۴]

۱. پژوهشگر پسادکترا، رشته جامعه‌شناسی مسائل اجتماعی، گروه آموزشی جامعه‌شناسی توسعه، دانشکده علوم انسانی و اجتماعی، دانشگاه مازندران، بابلسر، ایران و دبیر مطالعات اجتماعی شهرستان قائم‌شهر
۲. استاد جامعه‌شناسی محیط‌زیست، گروه آموزشی جامعه‌شناسی توسعه، دانشکده علوم انسانی و اجتماعی، دانشگاه مازندران، بابلسر، ایران
۳. دانشیار جامعه‌شناسی مسائل اجتماعی، گروه آموزشی جامعه‌شناسی توسعه، دانشکده علوم انسانی و اجتماعی، دانشگاه مازندران، بابلسر، ایران
۴. استادیار گروه مدیریت پیشگیری از جرم، دانشکده فرماندهی و مدیریت انتظامی، دانشگاه جامع علوم انتظامی امین، تهران، ایران

نویسنده مسئول:
صادق صالحی
رایانامه: s.salehi@umz.ac.ir

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چکیده

در میان بخش‌های مختلف اجتماعی، دانش‌آموزان یکی از مهم‌ترین گروه‌های اجتماعی محسوب می‌شوند که مخاطبان آموزش محیط‌زیست قرار می‌گیرند. هدف از مطالعه حاضر، بررسی عوامل اجتماعی مؤثر بر رفتار مصرف آب دانش‌آموزان است. از نظر روش‌شناسی، تحقیق حاضر با استفاده از روش پیمایش و در سطح مدارس متوسطه اول و دخترانه شهر بابل در استان مازندران و بهار ۱۴۰۳ انجام شده است. تعداد ۱۰۰ دانش‌آموز به‌عنوان نمونه آماری انتخاب شدند و برای جمع‌آوری داده‌های موردنیاز از پرسشنامه استفاده شده است. داده‌های حاصل از تحقیق با استفاده از Spss24 مورد توصیف و تجزیه‌وتحلیل قرار گرفت. یافته‌های پژوهش حاضر نشان داده است که میانگین رفتار مصرفی دانش‌آموزان در سطح متوسط قرار دارد. تحلیل همبستگی اسپیرمن وجود رابطه آماری معنی‌دار بین تعداد اعضای خانواده و رفتار مصرف آب را تأیید نموده است. طبق تحلیل آنووا هیچ تفاوت معنی‌داری بین پایه‌های تحصیلی و رفتار مصرف آب مشاهده نشده است. نتایج تحقیق بر اساس ضرایب رگرسیونی نشان داد که هنجار اخلاقی و کنترل رفتاری درک شده بیشترین تأثیر را بر رفتار مصرفی آب در دانش‌آموزان دارند. با توجه به نتایج به‌دست‌آمده پیشنهادهایی در جهت تقویت هنجارهای اخلاقی و افزایش آگاهی از پیامدها ارائه گشت.

واژه‌های کلیدی

استان مازندران، دانش‌آموزان، رفتار مصرف آب، کنترل رفتاری ادراک‌شده، هنجار اخلاقی.

Introduction

The environmental crisis in Iran is a declared situation that conflicts with the values of a significant number of people, and action must be taken to change that situation. In other words, environmental degradation in Iran has presented itself as a risk issue (Salehi et al., 2020). “Gary Lewis, the representative of the United Nations Environment Program in Iran, stated in his annual report in 2018 that the first and most important environmental threat in Iran is water” (Salehi & Pazokinejad, 2016: 222).

On average, 61 percent of Iran's area is in various drought categories (Ministry of Energy, 2019). The amount of freshwater waste is another problem. According to research, the lack of institutionalization of the culture of optimal consumption and the low price of water are the most important factors in non-optimal household water consumption in Iran (Kadkhodaei et al., 2020).

On the other hand, in recent years, widespread migration to the northern provinces of Iran, including Mazandaran, has made water consumption a challenge. Climate change in various provinces—especially those located in the arid and semi-arid geography of Iran, along with air pollution, dust, and water shortages, has caused permanent migration not only from Tehran and Alborz provinces but also from other provinces, which puts increased pressure on the water reserves of the northern provinces.

This shows that despite the Iranian-Islamic culture and religious teachings on consumption behavior, water has not yet been accepted as a social issue.

Socio-cultural studies of water consumption in Iran have only begun in the last decade, but the social aspects of water consumption behavior among students have not been examined in detail, and such studies are relatively new in this area.

As Lipchen (2003) points out, environmental issues such as water scarcity generate a series of social perspectives, and to achieve a correct understanding and knowledge of these issues, it is necessary to conduct social studies at the level of individuals and groups within society that are related to these issues.

The laws of the Islamic Republic of Iran also pay attention to the principle of protecting natural resources, including water. Article 50 of the Constitution considers environmental protection a public duty (Constitutional Law, n.d.: 13).

Education is one of the systems responsible for raising and developing human beings, and the quality of a teacher's educational performance plays a major role in shaping today's learners (Esmailzadeh, 2020).

Saif (2013) defines education as a systematic and continuous process that aims to guide the comprehensive development of the personality of the learners to acquire and understand human knowledge, socially accepted norms, and also to help the learners' talents flourish.

Because the best age for socialization is childhood and adolescence, raising awareness about the level of knowledge, concern, attitude, and performance of students towards water consumption can greatly help in planning and assessing the needs of the community for environmental education in schools and in families.

Reforming consumption patterns requires building a sustainable culture so that all members of society feel the need to reform consumption behaviors, and gradually this reform becomes institutionalized and turns into a sustainable behavior and ultimately into a culture in all areas of consumption (Rajaeian et al., 2017).

Students are among the human resources of the future who will enter society over time, and as the heirs of society, they need to acquire skills to promote environmental literacy and responsibility in the dimensions of knowledge, attitude, and individual behavior.

Not only should environmental knowledge be taken into account, but minds should also be made familiar with and sensitive to environmental problems and concerns (Rahimi et al., 2023).

This study will answer two questions:

a) What is the behavior of students towards water consumption?

b) What social factors are related to students' water consumption behavior?

Literature Review

Salehi & Ebrahimi (2019) investigated the level of water knowledge among students. This study

was conducted using a survey method among junior high school students in urban areas of seven cities in Mazandaran province, where 501 students were selected using a probability sampling method. According to the results of Pearson correlation analysis, the relationship between knowledge, values, environmental attitudes, and religious beliefs with students' water consumption behavior was confirmed. Also, the relationship between civic participation and water consumption behavior was confirmed, but no relationship was observed between environmental knowledge and water consumption behavior. Finally, a positive correlation was observed between institutional factors (formal and informal control) and water consumption behavior.

Yazarlu et al. (2020) investigated the factors affecting the water conservation behavior of villagers in Golestan province. A total of 508 people participated in this survey. The theory of planned behavior was used as a theoretical framework. Moral norms, attitudes, and perceived behavioral control had an impact on the water conservation behaviors of village residents.

Movahedi & Ataei Assad (2021) investigated the environmental behavior of students in Hamedan city. This study was a survey, and its statistical population consisted of 3,000 female students, of whom 320 were selected as a statistical sample based on the Morgan table. The results of this study showed that the environmental behavior of students was at an average level, and 31% of it was explained by knowledge, 21% by attitude, 10% by personal characteristics, and 27% by social factors (membership in non-governmental organizations, social networks of friends, neighborhoods and neighbors, and school), while the influence of media was measured at 0.70.

Savari et al. (2022) investigated the socio-psychological factors affecting the water consumption behavior of villagers in Khuzestan. The theory of planned behavior was used as a theoretical framework. Data were collected using quantitative and survey methods, and a questionnaire was used to collect them. Structural modeling was used to analyze the determinants. A sample of 340 people was selected using the Morgan table. The indicators used in structural modeling confirmed the model's fit. The results confirmed that 35% of the intention to consume properly and 54% of the act of consuming water were explained by the model. The variables of justification, intention, habits, and moral norms had a direct effect on consumption behavior, and justification had the greatest effect.

Erhabor & Braimoh (2020) used a quantitative approach and survey method to investigate the factors affecting the environmental behavior of secondary school students in Nigeria. Out of a population of 15,116 students, 255 public and private school students completed a researcher-made questionnaire. According to the findings, most respondents had little knowledge about waste disposal, wildlife conservation, and renewable energy, while they had high knowledge about pollution control. Their environmental attitude was also high, but there was a gap between attitude and actual environmental behavior.

Sousa et al. (2024) investigated the factors affecting the consumption of tap water versus mineral water among students in Portugal using the theory of planned behavior. In this survey, 413 students participated. The findings showed a positive and significant effect of attitude, subjective norms, and perceived behavioral control on the intention to consume mineral water. However, there was a large gap between attitude and actual behavior regarding tap and mineral water consumption, indicating a general tendency among students to consume more water.

Therefore, it can be concluded that people who have a positive attitude towards water consumption, adhere to the moral norms of society, and have internal control over their consumption behavior are more likely to engage in sustainable water use. In the literature review, researchers have also studied the effectiveness of each of these behavioral predictors and observed their positive or negative effect or lack of effect. In the present study, attention has also been paid to the role of these variables in the rate of change in students' water consumption behavior.

Theorithical Literature

In recent years, many approaches and behavioral models have been proposed to study the emergence of behaviors and the factors influencing them in various fields, including environmental protection behaviors (Wang et al., 2018; Savari et al., 2022).

In the theory of planned behavior, human behavior is guided by three types of belief: beliefs about the likely consequences or other attributes of the behavior (behavioral beliefs), beliefs about normative expectations of others (normative beliefs), and beliefs about factors that may enhance or inhibit the performance of the behavior (control beliefs). Behavioral beliefs create favorable or unfavorable attitudes toward the behavior. Normative beliefs result from perceptions of social pressure or internal norms, and control beliefs emerge from perceptions of behavioral control.

In turn, intentions are predicted by attitudes (positive or negative evaluations of the behavior), subjective norms (perceptions of social support for the behavior from important others), and perceived behavioral control (perception of the extent to which the behavior is under volitional control) (Fielding et al., 2012).

The ease or difficulty of the behavior is a combination of attitude toward the behavior, internal norms, and perceptions of behavioral control that lead to the formation of behavioral intention. Ultimately, given an adequate perception of actual control over the behavior, it is expected that people will intend to perform it when given the opportunity. However, many behaviors present challenges that may limit voluntary control. Therefore, it is better to consider perceived behavioral control alongside intention (Savari et al., 2022).

Attitude plays a central role in social psychology theories (Ajzen, 2012; Fielding et al., 2012). Attitude toward a behavior emphasizes the context in which a person evaluates the behavior as desirable or undesirable. A positive attitude towards water consumption can lead to a reduction in its consumption.

Moral norm is another variable in social psychological theories, such as the theory of planned behavior, belief-value-norm theory, or norm activation theory, which refers to the social pressure or influence that affects an individual when choosing an action to perform. Moral norms determine the correct and optimal utilization of available water resources by shaping human decisions. These norms, as socially accepted value standards regarding behavioral dos and don'ts, can affect human attitudes and behaviors (Liu et al., 2011; Yazarlu et al., 2020).

Perceived behavioral control is an individual's perception of the difficulty or ease of performing a particular action (Savari et al., 2022). In other words, an individual thinks that he or she can control his or her behavior (Franken et al., 2023). Ajzen (2012) believes that control beliefs arise from an individual's perceptions of their ability to perform a behavior, or perceived behavioral control. Perceived behavioral control represents practical or actual behavioral control, which refers to the degree to which one has the resources and skills necessary to perform a behavior. If all prerequisites for performing a behavior are present, perceived behavioral control can directly affect behavior (Ali et al., 2018).

Another variable that affects behavior is the justification of consumption behavior. Justification is the rationalization of the consequences of deviant and irresponsible behavior so that the person can protect themselves from shame and blame from others. There are people in society who, despite having environmental attitudes and knowledge, still cause damage to the environment through their actions and justify their behavioral motivation (Savari et al., 2022).

Justification is an internal cognitive process that both legitimizes a person's irresponsible action from their own perspective and allows them to defend themselves against punishment and blame from others (despite the subversion of formal and informal norms) (Hansmann et al., 2006). Therefore, people who waste water and do not adhere to the minimum social order justify their actions. This has a negative impact on the protection of water resources.

Research hypotheses

1. There is a difference between the average water consumption behavior of students at different educational levels.

2. Students' water consumption behavior differs according to family income levels.
3. There is a significant relationship between the number of family members and students' water consumption behavior.
4. Attitudes towards water resources affect students' water consumption behavior.
5. Moral norms affect students' water consumption behavior.
6. Perceived behavioral control affects students' water consumption behavior.
7. Justification for consumption behavior affects students' water consumption behavior.

Research Methodology

To conduct this research, an integrated approach (quantitative and qualitative) and a documentary method were used to review the literature on the subject, and a survey was conducted to collect the required information and data. The statistical population consisted of all female students of the first secondary school in Babol city in the academic year 1403-1404. In this study, probability sampling was used in which the probability of being selected for all members of the population is the same and known. 100 questionnaires were randomly distributed in girls' schools, generally in the classroom, and the students answered the questions. Water consumption behavior refers to the correct and optimal use of water resources and, in other words, is a plan and strategy that leads to a reduction in water consumption (Zobeidi et al., 2022). The items (I turn off the tap when I brush my teeth, I reduce the water pressure when washing my hands and face) were considered to operationalize water consumption behavior (M=3.84; SD= 0.98; α=0.73). Attitude plays a central role in social psychology theories. Attitude towards a behavior emphasizes the context in which a person evaluates the behavior as desirable or undesirable (Sánchez et al., 2018). Having a positive attitude is essential and necessary for a responsible behavior such as water consumption (Savari et al., 2022). To operationally define this concept, seven items were used in the form of a researcher-made scale (e.g. I think we have faced water shortages in the agricultural sector in the last ten years, I think the consumer himself should think about using water properly) (M= 4.72; SD= 0.85; α=0.70). Moral norm is the sense of having an internal moral commitment to the moral system of society. Moral norms are internalized forms of social norms that represent the approved way of acting and behaving in society (Savari & Charechaee, 2020). Four items defined by the researcher were used to operationally define this variable (e.g., I feel bad about wasting water, If I see someone wasting water, I consider it my duty to warn them) (M=3.70; SD=1.01; α=0.71). Conceptually, perceived behavioral control refers to individuals' beliefs about their ability to perform a behavior and control it (Bartlett et al., 2001). In the present study, perceived behavioral control was measured by a researcher-made scale. Items from previous domestic and foreign studies were used to construct this scale (Hansmann et al., 2006). Three items in the Likert scale format were used to operationalize this variable (M=4.65; SD=0.88; α=0.75). Five items were also used to operationalize justification, which was modeled on a study conducted by (Savari et al., 2022) (e.g., “The ways we can prevent water waste at home are difficult,” “My contribution to reducing water consumption is not that important because it prevents me from doing other things”), with two items being discarded due to low reliability (M= 4.03; SD= 0.95; α= 0.71). Age and number of family members were measured in the form of an interval scale. Family income level was measured in an ordinal scale, and income levels were divided into high, upper middle, middle, lower middle, and low.

Research Findings

The demographic characteristics of the sample studied show that out of a total of 100 students under study, 51% were in seventh grade, 46% in eighth grade, and 22% in ninth grade. The average age of the students was 14.35 years. The average family size was 3 members, and the income level was more than 65% at the average level.

Testing research hypotheses

In order to test the first hypothesis, the ANOVA test was used to compare means in more than two groups.

First hypothesis: There is a difference between the average water consumption behavior of students in different educational levels.

Table 1. F-test Result and its Statistic for the First Hypothesis

Var	Mean	SD	DF	F	Sig
Water consumption behavior (across educational levels)	2.14	1.015	81	1.14	0.34

As Table 1) shows, according to the significance level of the calculated F test (P>0.05), the hypothesis of a difference in mean water consumption behavior according to educational levels is rejected with a probability of less than 95 percent.

Testing Hypotheses 2 and 3

2. It seems that students' water consumption behavior varies according to family income levels.

3. It seems that there is a significant relationship between the number of family members and students' water consumption behavior.

The Spearman correlation test was used to examine these two hypotheses. Table 2 shows this analysis.

Table 2. Correlation Analysis of Water Consumption Behavior

Variables	Family income levels	Number of family members
Water consumption behavior	-0.08	-0.26*

* The correlation is significant at the 0.05 level.

As Table 2 shows, only the relationship between the number of family members and water consumption behavior is significant at a probability of 95%. This relationship is negative and weak. In other words, with the decrease in the number of family members, water consumption behavior also improves and becomes responsible.

Regression analysis (stepwise model) was used to examine hypotheses (4 -7). Tables (3 and 4) show this analysis.

Table 3. Stepwise Regression Model of Independent Variables to Explain Water Consumption Behavior in Students

R	R^2	F	Sig	Constant
0.53	0.25	11.67	0.000	13.95

The correlation coefficient of the stepwise regression model of independent variables for explaining water consumption behavior in students is 0.53. According to the coefficient of determination, 0.25 percent of the changes in water consumption behavior in students can be explained by 2 variables. According to the significance level of the F test, the independent variables explain the changes in water consumption behavior in students.

Table 4. Regression Analysis (Stepwise Mmodel) of the Dependent Variable of Water Consumption Behavior

Step 1	Var	Beta	T	Sig	Tolerance	VIF
Direct impact on water consumption behavior	Constant	-	3.63	0.001	-	-
	Moral norms	0.34	2.87	0.006	0.843	1.187
	Perceived behavioral control	0.29	2.42	0.019	0.843	1.187

As Table 4 shows, 25% of the changes in the theoretical model of water consumption behavior in students can be explained by two variables: moral norm and perceived behavioral control. Moral norms had the greatest impact on water consumption behavior. The T value of these two variables is greater than 2, and its significance level is less than 0.01, so it shows the influence of these two variables. Therefore, the order of acceptance and rejection of hypotheses (4 to 7) is as follows:

The effect of moral norm on water consumption behavior in students is confirmed.

The effect of perceived behavioral control on students' water consumption behavior is confirmed.

The effect of justification of behavior on students' water consumption behavior is not confirmed.

The effect of attitude towards water consumption on students' water consumption behavior is not confirmed.

Conclusion

In the present study, the effect of attitude towards water consumption on water consumption behavior was rejected. This finding is consistent with studies conducted by Salehi & Ebrahimi (2019), Movahedi & Ataee Asad (2021), and Sousa et al. (2024). Also, in the present study, justification of consumption behavior did not affect students' water consumption behavior, which contrasts with the results of the study conducted by Savari et al. (2022).

The present study showed that the effect of perceived behavioral control and moral norm on water consumption behavior is significant, which is confirmed by the findings of Savari et al. (2022) and Sousa et al. (2024). In a study conducted by Salehi & Ebrahimi (2019), the mean water consumption behavior varied by educational level, which is inconsistent with the present findings. That study also reported differences by family income level, which were not supported in this study.

According to the results, moral norms and perceived behavioral control are two internal factors that, if realized by individuals, can lead to responsible action. Students react to what happens in the environment or to others' behavior. Moral norms and perceived behavioral control refer to the belief that one can successfully perform a particular behavior. Internal control influences motivation and encourages persistence in that behavior. These two factors help students perceive the risk of potential harm or the possibility of damage to valuable resources.

Valuable resources are parts of a vulnerable system that are at risk of harm. These may include human life and health, income, a community's cultural identity, biodiversity, and natural ecosystems such as forests that absorb a significant portion of carbon emissions. Perceived behavioral control and ethical norms are both empowering and preventive factors.

Considering these explanations, the following suggestions can be made.

A) Strengthening norms for protecting water resources: The findings of this study showed that ethical norms have a significant impact on students' water consumption behavior. Therefore, with the aim of internalizing responsible behavior towards water consumption in students, educational programs for optimizing its consumption should be provided.

B) Increasing awareness: According to studies, awareness has an impact on perceived behavioral control. Awareness of the consequences of consumption behavior can change students' daily habits or bring them closer to correct and sustainable consumption patterns. Teachers and educators must enrich students' knowledge and internalize responsible actions by preparing educational films and documentaries about water scarcity, drought, water scarcity risks, global climate change, and consumption control strategies.

Notes

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