



## The Effects of Environmental Values on Pro-Environmental Behavior and Attitude of Housewives in Rafsanjan, Southeast Area of Iran

Hadi Eslami<sup>1</sup>, Zohreh Mohseni<sup>2</sup>, Foad Ranjbar Askari<sup>2</sup>, Hooriyeh Mirzaeimoghadam<sup>3</sup>, Mostafa Nasirzadeh<sup>3\*</sup>

<sup>1</sup> Department of Environmental Health Engineering, School of Health, Occupational Environment Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.

<sup>2</sup> Department of Environmental Health Engineering, School of Health, Student Research Committee, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.

<sup>3</sup> Department of Health Education and Health Promotion, School of Health, Occupational Safety and Health Research Center, NICICO, World Safety Organization and Rafsanjan University of Medical Sciences, Rafsanjan, Iran.

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#### \*Corresponding Author:

Mostafa Nasirzadeh

#### Email:

[mnasirzadeh13@yahoo.com](mailto:mnasirzadeh13@yahoo.com)

#### Tel:

+98 9131067118

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### ABSTRACT

**Introduction:** Indiscriminate consumption of energy, environmental pollution, and destruction of natural resources are among the most important issues related to pro-environmental behavior of people in society, and environmental values play an important role in shaping internal motivations of people about environmental issues. This study was conducted to determine the effects of environmental values on pro-environmental behavior and attitude of housewives in Rafsanjan, southeast area of Iran.

**Materials and Methods:** This cross-sectional study was conducted on 200 housewives who were selected as random in health-care centers in Rafsanjan city. The data collection was done by a validated questionnaire regarding environmental values, attitude, and behavior. Pearson correlation, independent t-test, and ANOVA statistical tests were used to analyze data in SPSS.V22 software.

**Results:** The mean score of environmental values was  $3.37 \pm 26.76$  (89.2%), which was significant according to the level of education ( $p = 0.016$ ). The mean score of attitude and environmental values was  $6.88 \pm 40.65$  (81.3%) and  $40.22 \pm 5.66$  (80.44%), respectively. Also, there was a significant relationship between the score of pro-environmental behaviors and the level of education ( $p = 0.012$ ). Pearson's correlation showed that there was a positive and significant relationship between environmental values and attitudes ( $r = 0.239$ ,  $p = 0.01$ ) and pro-environmental behaviors ( $r = 0.146$ ,  $p = 0.01$ ).

**Conclusion:** Based on the results, educated housewives believe more value for the environment, and have more appropriate pro-environmental behavior; thus, planning to sensitize society members, especially housewives, regarding the values of environmental protection through religious and cultural-based environmental education programs and increasing the level of education are recommended.

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### Introduction

Now days, one of the most important issues in the world is environmental challenges and problems that threatens health, well-being and security of

humans and other living organisms on the planet<sup>1,2</sup>. The unsustainable development of industry and transportation and the excessive consumption of energy have caused the destruction of the

environment and ecosystem, and the introduction of pollution into the environmental resources, including water, air, and food, has affected the quality and health of human life<sup>3,4</sup>.

One of the most important factors affecting environmental issues and problems is pro-environmental behaviors of people in society<sup>5</sup>. In recent decades, most environmental researchers have investigated to identify factors related to pro-environmental behaviors, and research shows that the most pro-environmental behaviors are determined by attitudes<sup>6,7</sup>.

Pro-environmental behaviors are any individual or collective activities that not only cause the least damage to the environment but also benefit the environment<sup>7,8</sup>. Pro-environmental behaviors can be done through direct and indirect methods to reduce environmental damage and improve the environment individually or collectively<sup>9</sup>. Humans need to communicate with the environment to meet their basic needs, and the importance of the environment for each person should be equal to the importance of their health<sup>10,11</sup>. However, one of the most important factors that pollutes and destroys the environment is humans and their activities such as development of transportation and industry, the consumption of fossil fuels, and the destruction of natural resources<sup>12-14</sup>. From the point of view of environmentalists, human self-centeredness and indifference to the non-human world, including nature, is the main cause of environmental destruction, which itself is caused by injustice and instrumental attitude towards the non-human world<sup>15,16</sup>. Human activities such as excessive use of natural resources and energy, cutting down trees and destroying forests, and constructing the industries and factories, which are rooted in the pro-environmental behavior of humans and societies, can change the face of the environment and create irreparable changes and environmental problems<sup>17-19</sup>. The main problems caused by environmental destruction are the ozone layer depletion, acid rains, climate changes and global warming, the occurrence of droughts, soil erosion, desertification, destruction of animal habitats, reduction of biodiversity, and reduction in the resource quality<sup>20-22</sup>.

Human-nature relationship and pro-environmental behaviors depend on various factors such as individual characteristics, gender, nationality, culture, values, and characteristics related to environmental issues<sup>23,24</sup>.

One of the main factors that determine pro-environmental behaviors is environmental values. Environmental value is the orientation of people towards the environment, and in fact, it is the importance and value of the environment from the perspective of society and individuals<sup>25,26</sup>. Values are guiding principles in people's personal lives and determine attitudes and behaviors<sup>27</sup>. On the other hand, attitudes are the driving force behind people's behavioral decisions, and knowing an attitude requires the empirical identification of a set of behaviors. For this reason, environmental attitudes are of great importance in creating effective measures regarding the preservation of biodiversity and environmental pollution<sup>25,28</sup>. Human behaviors are both the cause and the solution to the environmental problems of today's world, which are rooted in human values and attitudes toward the environment<sup>17,29</sup>. In fact, Environmental values are responsible for shaping many internal motivations of people for environmental protection behaviors<sup>30</sup>. For example, educating people about environmental consequences should lead to an increase in environmentally friendly behavior, but if people do not consider environmental protection an important personal value, this knowledge will not have a motivational force<sup>30,31</sup>. Therefore, today, investigating the environmental behavior of the community citizens and their factors is one of the most basic issues of the researchers in the field of environment. As a result, the quality of the environment and the effective control of environmental issues are completely dependent on the behavioral patterns of humans, and the environmental problems that we face in the world today are rooted in human behavior<sup>32</sup>.

Studies show that there is little knowledge about the relationship between human activities and the environment, which is due to insufficient information, lack of correct attitudes towards the environment, irresponsibility towards the

environment, and many other factors<sup>33</sup>. In fact, it is not possible to solve environmental problems without the awareness and sensitivity of people towards the environment, and this issue requires deep studies considering the new values and lifestyles that consumers have adopted<sup>34</sup>. Most studies have shown a positive relationship between pro-environmental behaviors and attitudes, but there are still uncertainties in this field and the issues need to be studied more deeply<sup>35, 36</sup>. Moreover, economic and technological methods and political guidelines are not enough to solve environmental problems, and these measures are less applicable to developing countries such as Iran due to their cost. Therefore, it can be said that without understanding social and cultural factors such as values, attitudes, motivations, and beliefs, the usual methods of solving environmental problems will be insufficient<sup>26</sup>.

Finally, considering the effects of environmental values on pro-environmental attitudes and behavior, it seems that measuring the level and degree of environmental value and the effect on pro-environmental attitudes and behavior, can play an important role in understanding the complex process of the factors influencing pro-environmental behavior. Therefore, this study aims to determine the effects of environmental values on pro-environmental behavior and attitude of housewives in Rafsanjan, southeast area of Iran in 2023.

### Materials and Methods

The current research was a descriptive and cross-sectional study conducted on the housewives in Rafsanjan, the southeast area of Iran in 2023. The sampling method was a multi-stage cluster random sampling. In this research, from all the healthcare centers in Rafsanjan city, two healthcare centers (number one and six) were randomly selected. Then, from the available housewives referring to these centers, 200 women were randomly selected based on the statistical Equation 1, where, expected prevalence was 85% ( $P = 0.85$ ) based on a similar study<sup>20</sup>, error level of 5% ( $d = 0.05$ ), and

confidence interval of 95% ( $Z = 1.96$ ).

$$n = \frac{P(1-P)Z^2}{d^2} \quad (\text{Equation 1})$$

The criteria for entering the study included married women with minimal literacy, an age range of 20-60, and permanent residence (at least for 5 years) in Rafsanjan city, and the exclusion criteria included unwillingness to cooperate in the study.

Data collection tool in this study was a questionnaire consisting of 4 sections. The first part was related to the demographic characteristics of people, which include age, sex, education level, family economic status, marital status, residence status, parents' occupation, and parents' education level. The second part included the questions of environmental values in the form of 6 items, the lowest score was 6, and the highest score was 30. The third part consisted of 10 items on environmental attitudes, the lowest score of which was 10 and the highest was 50. In addition, there were 10 items related to pro-environmental behaviors in the field of energy consumption, which according to the considered scale, the lowest score was 10 and the highest score was 50. Answering the questions in the questionnaire was based on self-reporting. The validity and reliability of this questionnaire were confirmed in similar studies, and the value of Cronbach's alpha was reported to be above 0.7<sup>20</sup>. Also, after the revision of the questionnaire by specialists in environmental health, health education, and promotion, the reliability of the questionnaire was remeasured by Cronbach's alpha which was 0.885 for environmental values, 0.85 for environmental attitudes, and 0.804 for pro-environmental behaviors questions.

Finally, the collected data was entered into the SPSS.V22 software, and Pearson correlation, independent t, and ANOVA tests were used to analyze the data at a significance level of less than 0.05.

### Results

The results related to the demographic characteristics of 200 women participating in the study, as well as the mean and standard deviation of the score of environmental values from the point of

view of the housewives of Rafsanjan city, were presented in Table 1. As the results show, from 200 participants, the majority (76%) were over 30, and the mean age of all the women was  $35.82 \pm 10.33$ ; 75% of the women were housewives, the majority of them (52.5%) had university education, and the number of family members was 3 or less in 43% of them. As can be seen in Table 1, the mean score of environmental values from the maximum obtainable score of 30, was  $26.76 \pm 3.37$ , which was significant according to the level of education. Women with a higher level of education (high school diploma and university education degree) had a higher score of environmental values ( $p = 0.016$ ) and valued the environment more. In addition, there was no significant relationship between environmental values and other demographic characteristics of people including age, occupation, spouse's education level, number of family members, and income level ( $p > 0.05$ ).

In Table 2, the results related to the mean and standard deviation of the attitude and environmental values and their relationship with the demographic characteristics of the women participating in the study in Rafsanjan city are presented. The mean score of people's environmental attitude was  $40.65 \pm$

6.88 from the maximum obtainable score of 50. Also, as can be seen in Table 2, there was no significant relationship between environmental attitude score and demographic characteristics of people, including age, the couples' education level, occupation, number of household members, and income level ( $p > 0.05$ ).

The mean score of people's pro-environmental behaviors was also  $40.22 \pm 5.66$  from the maximum obtainable score of 50, and there was a significant relationship between the mean score of pro-environmental behaviors, the subject's education level ( $p = 0.012$ ) and their spouse's education level ( $p = 0.037$ ). Therefore, with the increase in the education level of the family (women participating in the study and their husbands), the mean score of pro-environmental behaviors was higher, and more educated people had more appropriate pro-environmental behaviors.

Table 3 shows Pearson correlation between environmental values and attitudes and pro-environmental behaviors of housewife in Rafsanjan city. As can be seen, there was a significant and positive correlation between environmental values, attitudes ( $r = 0.239, p = 0.01$ ), and pro-environmental behaviors ( $r = 0.146, p = 0.01$ ).

**Table 1:** Demographic characteristics and mean score of housewife environmental values in Rafsanjan city

Demographic properties	Frequency		Environmental value score (mean $\pm$ SD)	P. value	
	Number	Percent			
Age (year)	< 30	68	34	26.08 $\pm$ 3.83	0.114**
	30-40	79	39.5		
	> 40	53	36.5		
Occupation	Housewife	150	75	26.56 $\pm$ 3.60	0.276*
	employed	35	25	27.36 $\pm$ 2.51	
Education level	Elementary and junior high degrees	36	18	24.75 $\pm$ 3.79	0.016**
	Senior-high diploma	59	29.5	27.03 $\pm$ 2.50	
	University education	105	52.5	27.48 $\pm$ 3.44	
Spouses' education levels	Elementary and junior high degrees	43	21.5	25.17 $\pm$ 4.90	0.142**
	Senior-high diploma	72	36	27.08 $\pm$ 2.79	
	University education	85	42.5	27.25 $\pm$ 2.67	
Household member	$\leq 3$	86	43	26.43 $\pm$ 4.01	0.498**
	4	74	37	27.01 $\pm$ 3.04	
	$\geq 5$	40	20	27.25 $\pm$ 2.56	
Income (million tomans)	< 5	81	40.5	26.54 $\pm$ 3.08	0.531**
	5 - 8	54	27	26.41 $\pm$ 4.15	
	> 8	65	32.5	27.33 $\pm$ 3.04	

\*Independent t-test; and \*\*ANOVA

**Table 2:** Mean score of environmental attitude and pro-environmental values of housewife in Rafsanjan city

Demographic properties		Environmental attitude (mean ± SD)	Pro-environmental behavior (mean ± SD)
Age (year)	< 30	40.29 ± 5.67	39.88 ± 5.17
	30-40	40.87 ± 6.83	40.02 ± 5.34
	> 40	40.65 ± 6.88	40.22 ± 5.66
P-value	0.468	0.365	
Occupation	Housewife	40.18 ± 7.30	40.39 ± 5.93
	employed	42.01 ± 5.31	39.83 ± 4.83
P-value (Independent t-test)		0.157	0.347
Education level	Elementary and junior-high degrees	39.41 ± 7.23	39.10 ± 5.21
	Senior-high diploma	40.75 ± 6.55	40.41 ± 7.37
	University education	41.06 ± 7.30	42.05 ± 4.84
P-value (ANOVA)		0.191	0.012
Spouses' education levels	Elementary and junior-high degrees	39.91 ± 7.73	39.18 ± 5.31
	Senior-high diploma	40.55 ± 7.52	40.68 ± 5.35
	University education	41.08 ± 5.64	41.65 ± 6.51
P- value (ANOVA)		0.571	0.037
Household member	≤ 3	40.11 ± 7.133	39.62 ± 6.06
	4	41.08 ± 6.65	40.86 ± 5.19
	≥ 5	41.58 ± 6.84	41.46 ± 5.49
P- value		0.12	0.149
Income (million tomans)	< 5	40.51 ± 7.16	41.11 ± 5.42
	5 - 8	39.82 ± 5.26	39.66 ± 5.63
	> 8	41.49 ± 7.70	39.81 ± 5.73
P- value (ANOVA)		0.209	0.198

**Table 3:** Correlation between environmental values and attitudes, and pro-environmental and behaviors of housewife in Rafsanjan city

Correlation	Environmental value	Environmental attitude	Pro-environmental behavior
Environmental value	1	0.239**	0.256**
Environmental Attitude	0.239**	1	0.146*
Pro-environmental behavior	0.256**	0.146*	1

\*\*Pearson correlation significant at the 0.01

\*Pearson correlation significant at the 0.05

## Discussion

Studies show that pro-environmental behaviors are related to many factors such as individual, social, and economic factors, customs, and values, and determining the main factor related to pro-environmental behaviors needs more research<sup>37, 38</sup>. In this research, housewives obtained a mean of 89.2% of the maximum score for environmental values, which showed that the level of environmental values regarding housewives in Rafsanjan city was appropriate. Housewives with a higher level of education had a higher environmental value score. The results of this study indicated that housewives scored 81.3% and 80.44% of the maximum score in the field of

environmental attitudes and pro-environmental behaviors, respectively, which showed that housewives of Rafsanjan had a proper status in terms of environmental attitudes and pro-environmental behaviors. Furthermore, there was no significant relationship between environmental attitudes and demographic characteristics; but, there was a significant and positive relationship between pro-environmental behaviors and the education level of housewives and their spouses. The study by Rastgar et al, investigated the effects of environmental values and lifestyle on pro-environmental behavior in Qom and Karaj showed that the spirit of excitement, biological patterns and lifestyle were the best indicators related to pro-



environmental behaviors, and the level of education had a positive effect on pro-environmental behavior<sup>23</sup>. In a study by Casaló and Escario in Spain, pro-environmental behavior was positively correlated with education level<sup>36</sup>. Azizah reported the significant effects of environment knowledge on the housewives attitude with regard to maintaining environmental cleanliness<sup>34</sup>. The results of these studies were consistent with the present study, and it can be said that the level of education was one of the significant factors in the pro-environmental attitudes and behaviors. In an educated society, when people have more awareness of environmental issues, they will be more sensitive to environmental conservation, and therefore, have better behaviors towards their environment<sup>39</sup>. Liu et al reported that education level had a great impact on the relationship between awareness, attitude, and pro-environmental behaviors, and with an increase in the level of education, the transformation of environmental awareness and attitude into appropriate pro-environmental behavior will be more effective<sup>7</sup>. A study by Dastras and Khajenoori about the relationship between sociological factors and pro-environmental behavior of the citizens in Shiraz, Iran, showed that there was a significant relationship between sociological factors, i.e. environmental knowledge, emotional connection with the environment, environmental attitude and value, priority, responsibility, and environmental motivation, and pro-environmental behavior<sup>3</sup>.

In this study, housewives had appropriate environmental values, attitudes, and behavior, which was consistent with the results of Yapici et al.'s study on students in Turkey; they showed that women's attitudes and behavior towards the environment were more positive and their risk perception was higher compared with men<sup>27</sup>. Also, in the study by Casaló and Escario, women have better pro-environmental behaviors than men<sup>36</sup>. It can be said that housewives or women compared to man, were more influenced by lifestyle and social norms, and as a result, they had more appropriate pro-environmental behaviors<sup>40</sup>.

In this study, there was a significant positive correlation between environmental values and attitudes and pro-environmental behaviors. In fact, with an increase in environmental values, the attitude towards the environment is improved, and more suitable pro-environmental behaviors are formed, which was consistent with the findings of Tan et al. on the relationship between environmental values and environmental attitudes. Their findings demonstrated that there was a significant positive correlation between environmental values and environmental attitudes<sup>31</sup>. Kurniawan et al. reported that people with higher environmental knowledge had higher levels of pro-environmental behaviors<sup>41</sup>. The study by Li et al. on environmental values and behaviors in young people showed that environmental values had a significant positive relationship with pro-environmental behaviors, and risk perception and moral anger played a very important role in this relationship<sup>30</sup>. Chwialkowska et al. studied the cultural values and pro-environmental behavior, the results of which indicated that cultural values had a significant effect on pro-environmental concerns and behaviors and reduced the gap between intention and pro-environmental behavior. Therefore, communication strategies related to cultural values can be used to promote pro-environmental behaviors<sup>26</sup>. Also, Bolderdijk et al. reported that those who cared about the environment were more willing to act on their values<sup>21</sup>. Therefore, similar studies showed that environmental values, attitudes, and pro-behaviors were completely interdependent and could not be separated from each other. As a result, it can be said that conducting religious and cultural-based environmental education programs can increase the sensitivity of people to the environment who subsequently may show environmentally friendly behaviors<sup>41</sup>.

Of course, it should be noted that environmental values were not the only variables influencing attitudes and pro-environmental behaviors. The study by Salehi and Karimzadeh on the effects of environmental values on pro-environmental behavior in the urban areas of Urmia showed that

environmental values played an important role in shaping pro-environmental behavior, but it should be noted that value was not the only variable that guides behavior, and besides that, the role of variables such as knowledge, attitude and perception<sup>29</sup> should be taken into account. In a study by Liu and et al. the results showed that environmental knowledge had a positive effect on environmental attitudes and pro-environmental behaviors<sup>3</sup>. The study by Nosratinjad et al. was conducted on the sociological explanation of the pro-environmental behavior of Tehran citizens and showed that there was a significant positive relationship between environmental knowledge and attitude and pro-environmental behavior; overall, these two variables accounted for 6% of the variance of pro-environmental behavior<sup>13</sup>. Hallaj et al. reported that environmentally-friendly attitude and values had a significant effect on pro-environmental behaviors. Also, most of the farmers had an environment-friendly attitude, and individual norms had the greatest impact on pro-environmental behaviors<sup>42</sup>. Wut et al studied the effect of attitude on pro-environmental behaviors in Hong Kong university students; their findings revealed that environmental attitude affected pro-environmental behaviors through lifestyle and social norms<sup>40</sup>. Finally, it can be said that in addition to environmental values, other effective factors on pro-environmental attitudes and behaviors such as lifestyle, individual and social norms, knowledge, and perception of environmental issues should also be given more attention<sup>43</sup>. Therefore, it is recommended that the effective factors related to pro-environmental attitudes and behaviors be studied in future.

### Conclusion

This study determined the role of environmental values in creating environmental attitudes and pro-environmental behaviors and its influencing factors. Based on the obtained results, the housewives scored 89.2, 81.3 and 80.44% in terms of value, attitude, and pro-environmental behaviors, respectively, which represents the suitable status of the housewives in Rafsanjan,

Iran. Housewives with a higher education level show more environmental value, and more educated women demonstrate more appropriate pro-environmental behaviors. Also, housewives who value the preservation of the environment have pro-environmental behaviors and better attitudes. Therefore, it is recommended to sensitize the public, especially housewives, regarding the values of environmental protection and its role in society's health by increasing education level and awareness in society through religious and cultural-based environmental education programs. Such programs can have a significant effects on improving the level of environmental attitudes and lead to more appropriate pro-environmental behaviors in society.

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### Conflict of interest

The authors declared no conflicts of interest.

### Ethical Issue

The study was approved by Ethics Committee of Rafsanjan University of Medical Sciences, Rafsanjan, Iran with ethical code of IR.RUMS.REC.1400.267. Also, informed consent was obtained from all the participants before collecting data.

### Authors' contributions

Hadi Eslami, Zohreh Mohseni, and Mostafa Nasirzadeh contributed to the study's conception, design, and questionnaire preparation. Data collection was performed by Zohreh Mohseni, Foad Ranjbar Askari, and Hooriyeh Mirzaeimoghadam. Data analysis and manuscript preparation and revising were conducted by Hadi Eslami. All the authors read and approved the final manuscript.

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## References

1. Agathokleous E, Calabrese EJ. A global environmental health perspective and optimisation of stress. *Sci Total Environ.* 2020;704:135263.
2. Eslami H, Khodadadi H, Safari A, et al. Determinants of the public environmental issues and concerns: a case study in Rafsanjan, Iran. *Journal of Environmental Health and Sustainable Development.* 2020; 5(4): 1109 -16 .
3. Dastras F, Khajenoori B. Investigating the relationship between sociological factors and environmental behavior of citizens of Shiraz. *Journal of Applied Sociology.* 2019;30(4):35-58.
4. Eslami H, Hasanshahi N, Ebrahimi Z, et al. Assessment of heavy metal concentrations in water purifier devices in Rafsanjan city. *Journal of Environmental Health and Sustainable Development.* 2023;8(2): 1988-98.
5. Lange F. Behavioral paradigms for studying pro-environmental behavior: a systematic review. *Behav Res Methods.* 2023;55(2):600-22.
6. Miller LB, Rice RE, Gustafson A, et al. Relationships among environmental attitudes, environmental efficacy, and pro-environmental behaviors across and within 11 countries. *Environ Behav.* 2022;54(7-8):1063-96.
7. Liu P, Teng M, Han C. How does environmental knowledge translate into pro-environmental behaviors?: the mediating role of environmental attitudes and behavioral intentions. *Sci Total Environ.* 2020;728:138126.
8. He M, Blye CJ, Halpenny E. Impacts of environmental communication on pro-environmental intentions and behaviours: a systematic review on nature-based tourism context. *Journal of Sustainable Tourism.* 2023;31(8):1921-43.
9. Lou X, Li LMW. The relationship of environmental concern with public and private pro environmental behaviours: a pre registered meta analysis. *Eur J Soc Psychol.* 2023;53(1):1-14.
10. Martin L, White MP, Hunt A, et al. Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *J Environ Psychol.* 2020;68:101389.
11. Grilli G, Curtis J. Encouraging pro-environmental behaviours: a review of methods and approaches. *Renew Sustain Energy Rev.* 2021;135:110039.
12. Coertjens L, Boeve-de Pauw J, De Maeyer S, et al. Do schools make a difference in their students' environmental attitudes and awareness? evidence from Pisa 2006. *Int J Sci Math Educ.* 2010;8:497-522.
13. Nosratinejad F, Serajzadeh SH, Dayhol M. Sociological explanations of environmental behavior (case study: Tehran citizens). *Sustainable Development of Geographical Environment.* 2020;2(2):33-52.
14. Zhao C, Mo D, Yuxiang J, et al. A 7000 year record of environmental change: evolution of Holocene environment and human activities in the Hangjiahu plain, the lower Yangtze, China. *Geoarchaeology.* 2023;38(3):335-50.
15. Sloot D, Kutlaca M, Medugorac V, et al. Recycling alone or protesting together? values as a basis for pro-environmental social change actions. *Front Psychol.* 2018;9:366015.
16. Holm P, Adamson J, Huang H, et al. Humanities for the environment—a manifesto for research and action. *Humanities.* 2015;4(4): 977-92.
17. Aznar-Díaz I, Hinojo-Lucena FJ, Cáceres-Reche MP, et al. Environmental attitudes in trainee teachers in primary education. The future of biodiversity preservation and environmental pollution. *Int J Environ Res Public Health.* 2019;16(3):362.
18. Kaiser FG, Arnold O, Otto S. Attitudes and defaults save lives and protect the environment jointly and compensatorily: understanding the behavioral efficacy of nudges and other structural interventions. *Behavioral sciences.* 2014;4(3): 202-12.
19. Aladejare SA. The human well-being and environmental degradation nexus in Africa. *Environmental Science and Pollution Research.*



- 2023;30(5):12098-113.
20. Salehi S, Karimnejad S. An analysis on relationship between environmental values and new environmental attitudes (case study: Urmia). *Cultural Studies & Communication*. 2014;10(37): 153-70.
  21. Bolderdijk JW, Gorsira M, Keizer K, et al. Values determine the (in) effectiveness of informational interventions in promoting pro-environmental behavior. *PLoS One*. 2013; 8(12):e83911.
  22. Panda R, Maity M. Global warming and climate change on earth: duties and challenges of human beings. *International Journal of Research in Engineering, Science and Management*. 2021;4(1):122-5.
  23. Rastgar A, Hashemian SMH, Alavi SS. Environmental values and lifestyles as determining factors of ecological consumer behavior. *Management Studies in Development and Evolution*. 2017;25(83):69-92.
  24. Dornhoff M, Sothmann JN, Fiebelkorn F, et al. Nature relatedness and environmental concern of young people in Ecuador and Germany. *Front Psychol*. 2019;10:422312.
  25. Sargisson RJ, De Groot JI, Steg L. The relationship between sociodemographics and environmental values across seven European countries. *Front Psychol*. 2020;11:554943.
  26. Chwialkowska A, Bhatti WA, Glowik M. The influence of cultural values on pro-environmental behavior. *J Clean Prod*. 2020;268: 122305.
  27. Yapici G, Ögenler O, Kurt AÖ, et al. Assessment of environmental attitudes and risk perceptions among university students in Mersin, Turkey. *Journal of Environmental and Public Health*. 2017;2017(1):5650926.
  28. Marzban A, Barzegaran M, Hemayatkah M, et al. Evaluation of environmental awareness and behavior of citizens (case study: Yazd urban population). *Iranian Journal of Health and Environment* 2019;12(1): 17-30.
  29. Salehi S, Karimzadeh S. Investigating the impact of environmental values on environmental behavior (Study of Urmia urban areas). *Social Issues of Iran*. 2013;5(2):61-76.
  30. Li X, Liu Z, Wuyun T. Environmental value and pro-environmental behavior among young adults: the mediating role of risk perception and moral anger. *Front Psychol*. 2022;13:771421.
  31. Tan BC, Khan N, Lau TC. Dimensionality of environmental values and attitudes: empirical evidence from Malaysia. *Sustainability*. 2022; 14(21):14201.
  32. Ari E, Yılmaz V. A proposed structural model for housewives' recycling behavior: a case study from Turkey. *Ecological Economics*. 2016;129:132-42.
  33. Darabkhani RK, Hejazi SY, Rezaei A. The role of media and environmental education components on the behavior of environmental NGOs members in Tehran province. *Environmental Sciences*. 2019;17(1):195-210.
  34. Azizah LN. Analysis of environmental knowledge relationships to the attitude of housewives to maintain environmental cleanliness. *International Journal on advanced technology, engineering, and information system*. 2022;1(1):37-46.
  35. Amoah A, Addoah T. Does environmental knowledge drive pro-environmental behaviour in developing countries? evidence from households in Ghana. *Environment, Development and Sustainability*. 2021;23(2):2719-38.
  36. Casaló LV, Escario JJ. Heterogeneity in the association between environmental attitudes and pro-environmental behavior: a multilevel regression approach. *J Clean Prod*. 2018;175: 155-63.
  37. Saracevic S, Schlegelmilch BB. The impact of social norms on pro-environmental behavior: a systematic literature review of the role of culture and self-construal. *Sustainability*. 2021;13(9): 5156.
  38. Díaz MF, Charry A, Sellitti S, et al. Psychological factors influencing pro-environmental behavior in developing countries: evidence from Colombian and Nicaraguan students. *Front Psychol*. 2020;11:580730.
  39. Mónus F. Environmental education policy of schools and socioeconomic background affect environmental attitudes and pro-environmental

- behavior of secondary school students. *Environ Educ Res.* 2022;28(2):169-96.
40. Wut TM, Ng P, Kan HKM, et al. Does gender matter? attitude towards waste charging policy and pro-environmental behaviours. *Social Responsibility Journal.* 2021;17(8):1100-15.
41. Kurniawan E, Syifauddin M. Environmental knowledge, environmental value, and environmental behavior of santri at pesantren. *Turkish Journal of Computer and Mathematics Education (TURCOMAT).* 2021;12(8):235-47.
42. Hallaj Z, Sadighi H, Farhadian H. Investigation environmental attitude values in pro-environmental behavior of sisthan region's farmers in coping with drought. *Journal of Rural Research.* 2018;9(1):136-47.
43. Farhadian Babadi F, Mohseni Tabrizi A, Azkia M. Sociological explanation of environmental behavior based on lifestyle. *Iranian Sociological Review.* 2022;12(3):55-65.