Water Conservation Related Awareness and Practices of Families Living in Lahore

Nazma Malik[1*], Muhammad Abiodullah[2], Muhammad Nawaz Chaudhry[3]

[1]Department of Housing, Home Management and Interior Design, Government College of Home Economics Lahore, Pakistan.
[2]Institute of Education and Research, University of the Punjab, Lahore, Pakistan.
[3]Department of Earth and Environmental Sciences, University of the Punjab, Lahore, Pakistan.

*Corresponding author: Nazma Malik (Email: nazmamalik@live.com)

ABSTRACT

Pakistan, is likely to face serious water shortages in near future. Increasing level of awareness of the residents for water use can play an important role to control the deteriorating trend. For this purpose, a set of 19 questions were circulated to 800 residents of five localities of Southern Lahore at random, to obtain their views and adjudge their level of awareness. The data obtained have been correlated to the segments of respondents divided by the size of houses, level of education, age groups, family size and family income size. It was found that Medium house size saves more water as compared to large house size and respondents having age between 45-55 years are more aware than respondents <25 years on practices of water conservation. Similarly, household size from 1-4 are more aware regarding water conservation Practices as compared to household size (9-12). Graduate respondents are more aware than Matric and intermediate respondents in their Level of Awareness for water conservation practices.

Keywords: *Water crisis, Semi arid, Urban centers, Water awareness, Lahore*

1. INTRODUCTION

WDM is defined as the practical 'development and implementation of strategies aimed at influencing demand' (Savenije & Van Der Zaag, 2002). It is characterised by reducing average water consumption to ensure efficient and sustainable use of the resource (Brooks, 2002; Deverill, 2001; Tate, 1993). The reported incidents of groundwater depletion, rivers running dry and worsening pollution levels indicate the extent of growing water scarcity (Gleick, 1993; Postel, 2000; WWAP, 2012). Awareness is knowing something; knowing that something exists and is important. Sudarmadi et al. (2001) defines environmental awareness as the attention and concern of individuals to environmental problems. Folmer (2009) argues that human behavior is strongly influenced by awareness, perceptions, expectations and habits. When actions are taken for water reductions at home, many water related problems may decrease (Pittock & Connell 2010). Lahore, capital of Punjab, Pakistan, is a mega city of 12 million people, (located in a water stressed area of the country), growing at about 3.3% per year (Lahore Development Authority, 2013). Its aquifer is fast receding and the population is rapidly growing due to unplanned urbanization and diminishing recharge of the underground water resource.The knowledge and level of awareness provides firm basis to develop future plans and strategies. Wang, Xu, Huang, and Rozelle (2006) found that in communities where leaders are aware of water scarcity in their villages, water use was lower than in villages where awareness was lacking. Households residing in five localities of southern Lahore were chosen for a random survey to gauge their level of awareness about the existing situation of water in general.

2. METHODS

Selected localities of Lahore namely Gulberg, Lahore Cantonement Board (LCB), Model Town Society (MTS), Walton Cantonement Board (WCB) and Defense Housing Authority (DHA) were the target areas .To study the awareness level of these five localities a set of 19 questions was devised and circulated to 800 houses – 160 houses from each locality- for a random survey.

Questionnaire circulated to the respondents was grouped under five possible headings according to similarities in their content and applications. As a result of this combination the emerging groups are discussed under the titles of Modern Trends, Gadgets, General Knowledge, Practices and Instructions. Their reliability factor was worked out. Awareness scale was analyzed using principal component analysis, as a result five components emerged namely: Modern Trends, Gadgets, General Knowledge, Practices and Instructions. Cronbach reliability coefficient was calculated. It varies from 0.401 to 0.611. the overall reliability coefficient is 0.768. The groupings in Table 1 were chosen as basis for factorization and analysis. Since the possible options to tackle the state of

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awareness are the same in number and nature therefore it is pertinent to deal with it by using the present method in order to obtain more clear and logical results.

Table 1. The Reliability of the Scale "State of Awareness".

Scales	No of Questions	Reliability
Modern Trends	5	0.611
Gadgets	4	0.549
Knowledge	4	0.505
Practices	3	0.505
Instructions	3	0.401
Total	19	0.768

3. RESULTS

3.1. Size of Houses

For the purpose of this study, the sizes of houses were divided into four categories of Small, Medium, Big and Large. These sizes comprise of Small upto 10 Marlas (209m2, Medium, 10 to 20 Marlas (209m2- 418m2, Big, 20 to 40 Marlas (418m2-836m2) and large above >40 Marlas (>836m2) (1 Marla comprises of 25 square yards or 20.9m2 in urban area. The result of the data obtained from the four sizes of the houses of all the five localities and its correlation with the five groups of questions is given in Table 2.

3.2. Level of Education

The entire number of respondents was divided according to their level of education starting from middle (8 years of education) up to post graduate (more than 14 years of education) and beyond. People with different level of education are likely to vary in their level of awareness as well. In order to verify this belief a correlate worked out with the scale of reliability in Table 1.

3.3. Age Group

Five age groups were used to correlate with the five components starting from less than 25 years up to 55 years. To find out the response of respondents in this respect they were divided into four age groups starting with < 25, 25-35, and 35-45 up to 55 years old. The responses of these four to the five scales are given in Table 4.

3.4. Family Size

Four sizes of family starting from 1-2 persons to more than 12 persons were used to access the family size response to the consolidated group of questions and the result is depicted in Table 5.

3.5. Family Income Size

The respondents were divided into five income groups starting from an income of less than 25000 to an income of 100,000 per month. The results obtained are given in Table 6.

Table 2. Mean, SD of Level of Awareness.

	Modern Trends		Gadgets		Knowledge		Practices		Instructions	
	M	SD	M	SD	M	SD	M	SD	M	SD
Small	16.31	3.66	11.27	3.18	10.03	2.93	10.25	2.36	10.23	2.31
Medium	16.74	2.93	11.67	2.91	10.31	2.47	10.53	2.10	10.13	2.07
Big	16.25	3.05	11.78	2.94	9.76	2.73	9.82	2.06	10.29	2.30
Large	16.29	3.18	11.96	2.73	9.80	3.19	10.78	2.17	10.78	2.44
ANOVA	F	P	F	P	F	p	F	p	F	P
	1.14	0.33	1.65	0.18	1.30	0.27	3.41	0.02*	1.26	0.29

Note: *p<.05.

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Table 3. Mean SD of level of education of respondents and their level of awareness.

Education Level	Modern Trends		Gadgets		Knowledge		Practices		Instructions	
	M	SD	M	SD	M	SD	M	SD	M	SD
Middle	16.31	3.20	10.77	2.28	10.46	2.11	10.42	1.93	10.00	2.12
Matric	16.66	3.15	11.16	2.66	10.39	2.70	10.25	2.05	9.83	2.12
Inter	16.52	16.31	11.75	3.00	10.06	2.61	10.38	2.31	9.95	2.13
Graduate	16.32	16.66	11.46	3.23	9.99	2.77	10.33	2.28	10.57	2.28
Master	16.38	16.52	11.58	3.14	9.89	3.28	10.24	2.10	10.64	2.40
Others	17.00	16.32	11.75	2.75	9.00	4.97	9.50	3.42	13.50	1.00
ANOVA	F	p	F	p	F	p	F	p	F	P
	0.23	0.95	0.84	0.52	0.59	0.71	0.20	0.96	5.34	<.001*

*p<.0

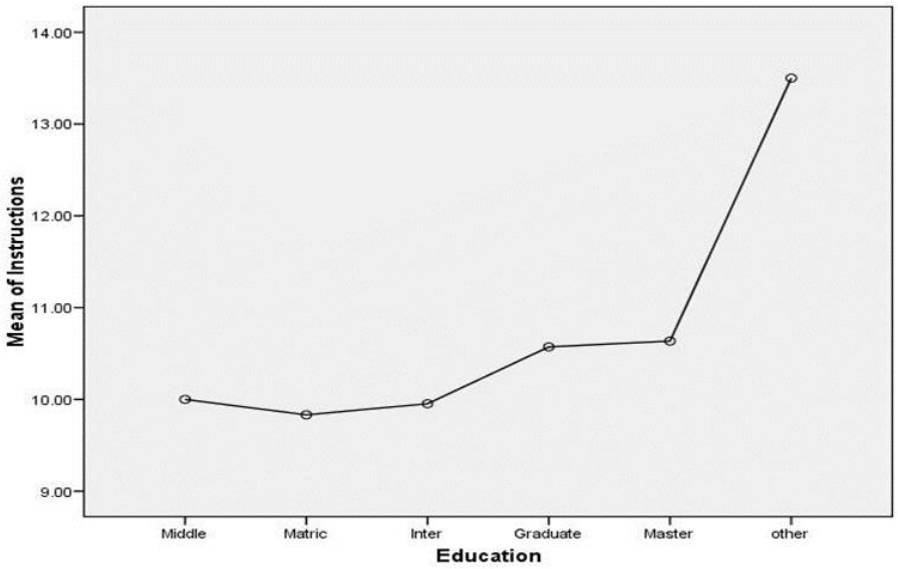

Figure 1. Mean, SD of education and level of awareness.

Table 4. Mean, SD of age of Respondents and Level of Awareness.

	Modern Trends		Gadgets		Knowledge		Practices		Instructions	
Age(years)	M	SD	M	SD	M	SD	M	SD	M	SD
<25	16.36	3.24	11.46	3.25	10.07	2.88	10.05	2.28	10.25	2.17
25-35	16.35	2.94	11.92	2.90	10.30	2.51	10.29	2.23	9.96	2.39
35-45	16.22	3.60	11.12	3.12	9.86	2.96	10.24	2.23	10.31	2.23
45-55	16.79	3.31	11.64	2.79	10.11	2.68	10.67	2.13	10.35	2.17
ANOVA	F	p	F	p	F	p	F	p	F	P
	1.28	0.28	2.07	0.10	0.67	0.57	3.15	0.02*	1.11	0.34

Note: *p<.05.

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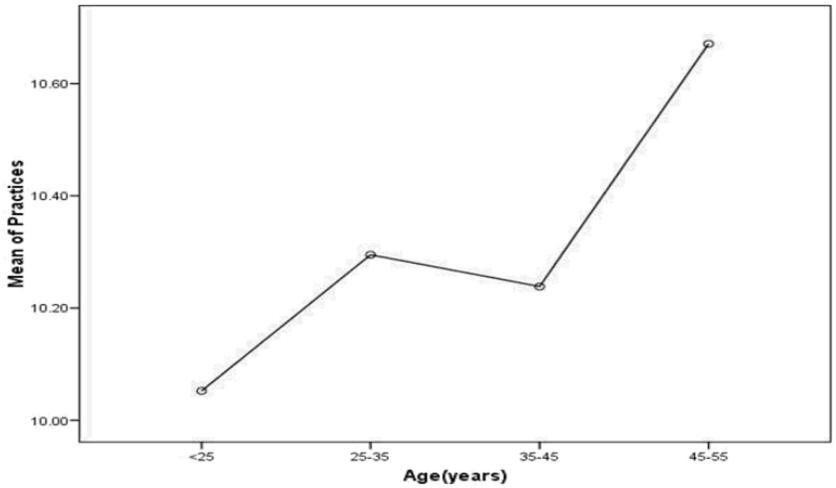

Figure 2. Mean, SD of respondents age and level of awareness.

Table 5. Mean, SD of household size and level of awareness.

	Household Size	Modern Trends		Gadgets		Knowledge		Practices		Instructions	
		M	SD	M	SD	M	SD	M	SD	M	SD
	1-4	16.25	3.01	11.89	2.65	10.28	2.41	10.65	2.01	9.77	2.14
	5-8	16.52	3.32	11.46	3.13	10.08	2.84	10.27	2.24	10.29	2.23
	9-12	16.49	3.53	11.31	3.09	9.83	2.83	9.97	2.38	10.53	2.25
>12	18.55	3.36		11.45	3.83	11.45	4.13	11.18	2.09	11.00	2.57
ANOVA	F	P		F	p	F	p	F	p	F	P
	1.72	0.16		1.10	0.35	1.56	0.20	3.02	0.03*	3.76	0.01*

Note: *p<.05.

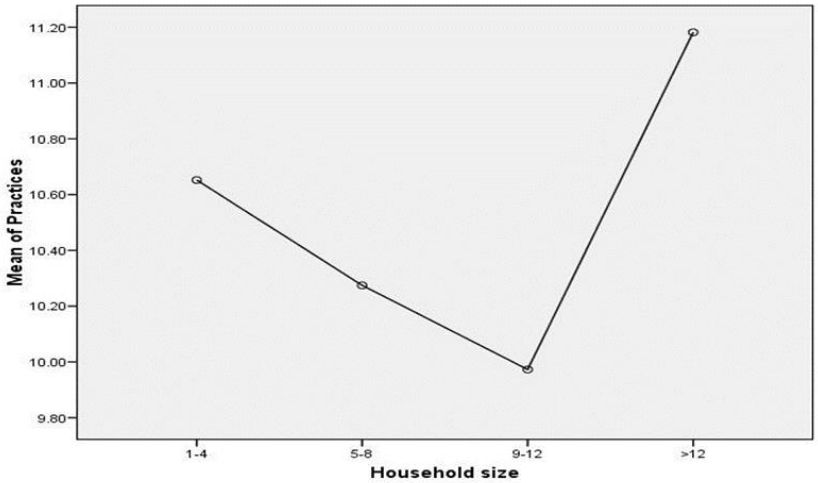

Figure 3. Mean, SD of household size (practices) and Level of Awareness.

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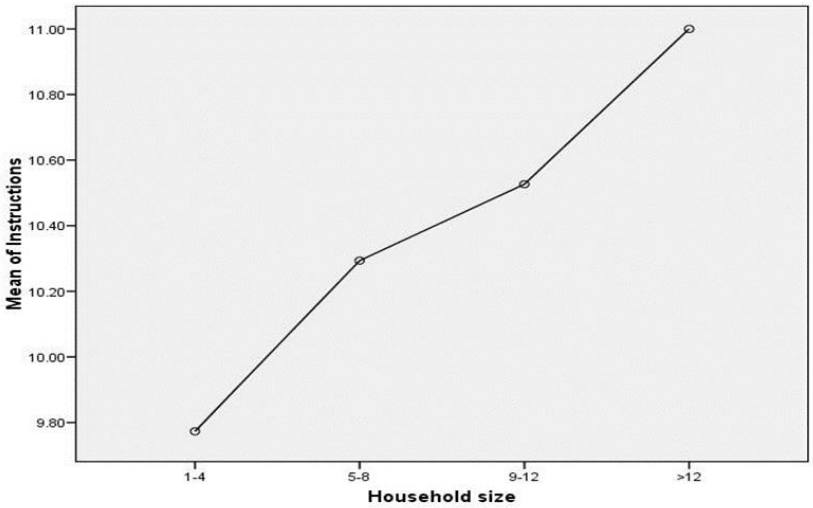

Figure 4. Mean, SD of Household Size (Instructions) and Level of Awareness.

Table 6. Mean, SD of Family Income and Level of Awareness.

Income	Trends									
	M	SD	M	SD	M	SD	M	SD	M	SD
<25000	15.67	3.75	11.08	3.32	9.76	3.15	9.90	2.52	9.70	2.51
25000-5000	15.83	3.62	10.87	3.17	9.78	2.96	10.13	2.46	10.62	2.18
50000-75000	16.14	3.32	10.85	2.83	9.42	2.70	10.04	2.43	10.37	2.22
75000-100000	16.15	3.81	11.42	3.29	10.37	2.77	9.75	2.46	10.73	2.33
>100,000	17.05	3.42	12.02	3.46	9.90	3.88	10.14	2.19	11.48	2.27
	F	P	F	P	F	P	F	P	F	P
ANOVA	1.475	0.209	1.773	0.133	1.168	0.324	0.486	0.746	4.555	<001*

Note: *<p.05.

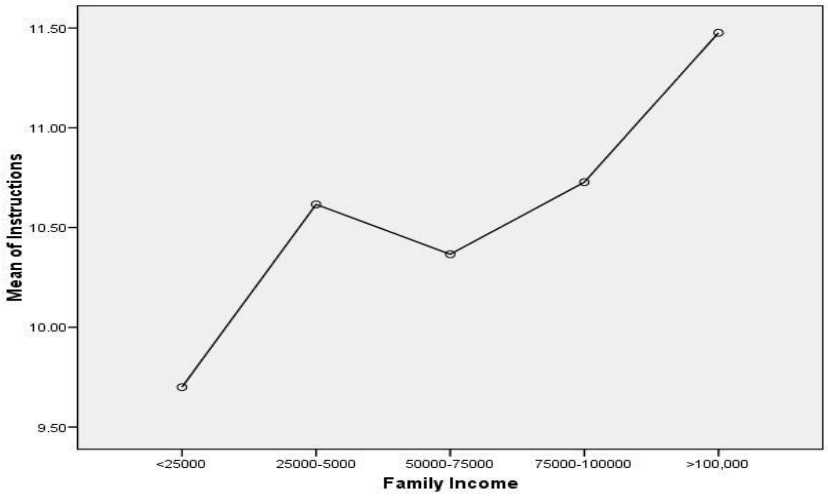

Figure 5. Mean, SD of Family Income and Level of Awareness.

4. DISCUSSION

The respondents are part of the urban population of a better part of a major city. This study and Its methodology can be used by other developing countries of the semi arid regions for improving water conservation. There is a significant difference between the residents of medium house size and large house size on water conservation practices. Medium house size saves more water as compared to large house size. Although world over comparatively, small households are considered to be using less water. In terms of relation between education and awareness level of the respondents, there is significant difference among Matric (10 years of education) and Intermediate (12 years of education) and Graduates (14 years of education) on doctrine on water use. In terms

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of age, a significant difference in respondents of age less than 25 and 45-55 years are seen. Respondents having age between 45-55 years are more aware than >25 years on practices of water conservation. Younger generation generally speaking are mostly more aware of such issues but not in this case, therefore respondents >25, needs to work upon in terms of spreading awareness of water conservation practices.

Household size from 1-4 are more aware regarding water conservation Practices as compared to household size (9-12) have less awareness. Similarly in terms of Instructions, household size (1-4) have less awareness compared to size 9-12, who are more aware. Therefore the need is to target family size 9-12 for water conservation awareness and for reading and following instructions on water bill, household size 1-4 should be focused. There is a marked difference in all the awareness fields between the low income family group of less than Rs 2500/month and more than 100,000 and beyond. A consistent state of variations has been found all along in all the correlates and it can be safely concluded that there exists a definite need to improve the state of awareness. A well coordinated effort at various levels would be quite fruit full and the improvement of the level of awareness about water would be worthwhile to safeguard the future of the city.

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CONFLICT OF INTEREST
The authors declare that they have no competing interests.

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