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Knowledge of Rural Women about Energy Conservation Equipment

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ABSTRACT

Energy is what makes the world grow, change and stay alive. Energy conservation is the act of using less of an energy service to cut down on energy use. It is believed that the house energy utilising in India accounts for almost 40 per cent of the country's total energy use. This research took place in the Hisar district of Haryana state and had the specific goal of looking into "The knowledge of rural women about energy conservation equipment." The College of Home Science chose four villages (Ludas, Rawalwas Khurd, Siswal and Neoli Kalan) to be part of the RAWE program in the past few years. To determine the knowledge gain of rural women, pre and post knowledge scores were computed and data were analysed using two sample "z" test. The study found that the majority of respondents (59.5%) were between the ages of 20 to 35 years of age group, 89.5 percent were married and 27.5 per cent had only completed their 10+2 education and worked primarily in farming activities. The solar dryer (M.S. = 0.82) had the greatest gain in knowledge about energy-conservation cooking equipment, while the solar lantern (M.S. = 0.74) had the greatest increase in knowledge about lighting equipment. The solar room cooler and solar tube well came next. The mean scores for each component of the energy-saving equipment before and after exposure showed notable variations.

Keywords: Energy, Knowledge gain, Rural women, Equipment, Home Science

INTRODUCTION

Energy conservation is the act of using less of an energy service to save energy. You can do this by either making the service use less energy (making it more efficient) or by cutting back on the overall quantity of service utilised. Energy conservation means using less energy that isn't needed or wasting it (Anonymous, 2025). Energy is the main thing that makes economies grow, and it is also very important for the long-term health of modern economies and societies. The long-term availability, accessibility, and security of energy supplies will have a big effect on how the economy grows in the future. Emerging countries have 80 per cent of the world's population, but they only use forty per cent of the energy that is utilised around the world. The high standard of living in industrialized countries is because they use a lot of energy. People in high-income nations use four to five times as much energy as people around the world and nine times as much as people in poor countries (Bureau of Energy Efficiency, 2009).

It is thought the residence energy use in India accounts for almost 40.0 per cent of the country's total energy use (Pachauri and Spreng, 2002).

Energy is an important requirement for the country's economic growth. All activities in business, transport, commerce and the home need energy. The country's overall use of energy has been going up steadily because the economy is growing quickly. The country is becoming more dependent on fossil fuels including coal, oil and gas

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as a result of the increase in energy demand. Each among these frameworks is steadily deteriorating as the price of petrol and oil increases (REN, 2009). The oldest energy source on Earth is the sunlight, which is as ancient as the sun itself. 95.8 trillion watts of energy are received by the world every second (Pearce, 2002). These days, environmental issues are highly valued by the public, private, and governmental sectors. Excessive energy use and increasing resource exploitation have impacted our environment. It is essential to improve energy efficiency and transition to clean energy sources in order to mitigate the negative environmental effects of growing energy use.

With the aforementioned factors in mind, the following specific objectives were established for the current investigation:

Objective:

1. To study the knowledge of rural women regarding energy conservation equipment.
2. To impart knowledge about energy conservation equipment and find out the gain in knowledge of respondents.

METHODOLOGY

The study was carried out in the Hisar region of Haryana state. In order to determine the rural women's prior knowledge of energy-saving devices, four villages—Ludas, Rawalwas Khurd, Siswal and Neoli Kalan adopted by the College of Home Science, CCSHAU, Hisar under the RAWE program in previous years were specifically chosen for the survey work in the Hisar district. From each village, fifty responders were chosen at random. 200 was the total sample size as a result. 100 rural respondents (25 from each village) who expressed interest and willingness to learn were given information about energy-saving devices. In order to meet the study's objectives, a pretested schedule for interviews was created. The interview schedule included questions to learn more about the respondents' backgrounds and their prior knowledge of energy conservation equipment. Objective II involved educating 100 rural respondents, 25 from each village about energy conservation equipment. Print media created by referencing pertinent material was used for dissemination knowledge. The gain in knowledge was measured after thirty days of imparting knowledge to 100 rural respondents. Frequencies, percentages, weighted mean scores and two sample "z" tests were used to process, tabulate and analyze the resulting data.

RESULTS AND DISCUSSION

Background profile of the respondents:

The data in Table 1 shows that the majority of respondents (59.5 %) were between the ages of 20 and 35, followed by 35- 50 (30.0%) and just 10.5 per cent were between the ages of 50-65 years. The majority of respondents (89.5 %) were married, 5.5 per cent were unmarried and 5.0 per cent were widowed. According to the respondents' caste, the majority (40.5%) were from the scheduled caste, followed by the backward class (30.0%) and the general caste (29.5%). More than half of the respondents (56.0%) came from nuclear families, with 44.0 per cent from joint families. The largest percentage of respondents (54.5%) had a family of five to seven people, followed by those with two to four people (37.0%) and those with eight to ten people (8.5%). The respondents' educational status showed that the majority had completed at least 10+2 (27.5%), followed by high school (21.0%), graduate school (16.0%), middle school (14.0%), primary school (12.0%) and only 9.5 per cent were illiterate. The majority of respondents (66.0%) were housewives, followed by 27.0 per cent who worked in agriculture, business (2.5%), labour (2.5%) and government service (2.0%). According to the income distribution, 71.4 per cent of respondents earned less than Rs. 25,000/- a month, while 28.6 per cent earned between Rs. 25,001 - Rs. 50,000. The majority of respondents' primary family occupation was farming (27.5%), followed by private service (24.5%), labour (21.0%), business (16.0%) and government service (11.0%). The majority (72.0%) of respondents reported having a family income of less than Rs. 25,000 per month, followed by those earning between Rs. 25,001 - 50,000 (23.0%) and Rs. 51,001 - 75,000 (5.0%).

The mean knowledge scores of participants about different energy-efficient appliances for cooking before and after imparting knowledge are shown in the table. Improved chulha (MDV chulha), pressure cookers, pellet stoves, box-type and dish-type solar cookers, and solar dryers are among the equipment. For every piece of equipment on the list, a notable increase in knowledge levels was noted. The findings in Table 2 indicate that the respondents' most significant gain in knowledge was

about solar dryers (M.S. = 0.82), which was statistically significant ('z'=21.23); these were followed by pellet stoves (M.S. = 0.74) and dish type solar cookers (M.S. = 0.71); the 'z' values for these aspects were significant at the 1 per cent level of significance. The respondents' least increase in knowledge was about pressure cookers

Table 1 : Background profile of the respondents (N=200)

Sr. No.	Variables	Category	Frequency (%)
1.	Age (in years)	20-35	119(59.5)
		35-50	60(30.0)
		50-65	21(10.5)
2.	Marital status	Married	179(89.5)
		Unmarried	11(5.5)
		Widow	10(5.0)
3.	Caste	SC	81 (40.5)
		BC	60(30.0)
		General	59 (29.5)
4.	Family type	Nuclear	112(56.0)
		Joint	88(44.0)
5.	Family size	2-4 members	74(37.0)
		5-7 members	109(54.5)
		8-10 members	17(8.5)
6.	Education of respondent	Illiterate	19(9.5)
		Primary	24(12.0)
		Middle	28(14.0)
		High School	42(21.0)
		10+2	55(27.5)
		Graduate and above	32(16.0)
7.	Occupation of respondent	Govt. service	4(2.0)
		Business	5(2.5)
		Farming	54(27.0)
		Labour	5(2.5)
		Housewife	132(66.0)
8.	Monthly income of respondent (Rs.)	< 25000	10(71.4)
		25001 - 50000	4(28.6)
9.	Main family occupation	Govt. service	22(11.0)
		Private service	49(24.5)
		Farming	32(16.0)
		Labour	55(27.5)
		Business	42(21.0)
10.	Total monthly family income	< 25000	144(72.0)
	(Rs.)	25001-50000	46(23.0)
		51001 -75000	10(5.0)

Table 2 : Gain in knowledge regarding energy conservation equipment for cooking (n=100)

Sr. No.	Equipment for cooking	Knowledge (mean score)			
1.	Solar cooker	Pre- knowledge	Post- knowledge	Gain in knowledge	z- value
a)	Box type	1.34	1.81	0.47	9.36**
b)	Dish type	1.07	1.78	0.71	15.56**
2.	Solar dryer	1.11	1.93	0.82	21.23**
3.	Improved *chulha* (MDV *chulha*)	1.32	2.00	0.68	14.50**
4.	Pressure cooker	1.78	2.00	0.22	4.28*
5.	Pellet stove	1.07	1.81	0.74	16.78**

*Significant at 5% level of significance
**Significant at 1% level of significance

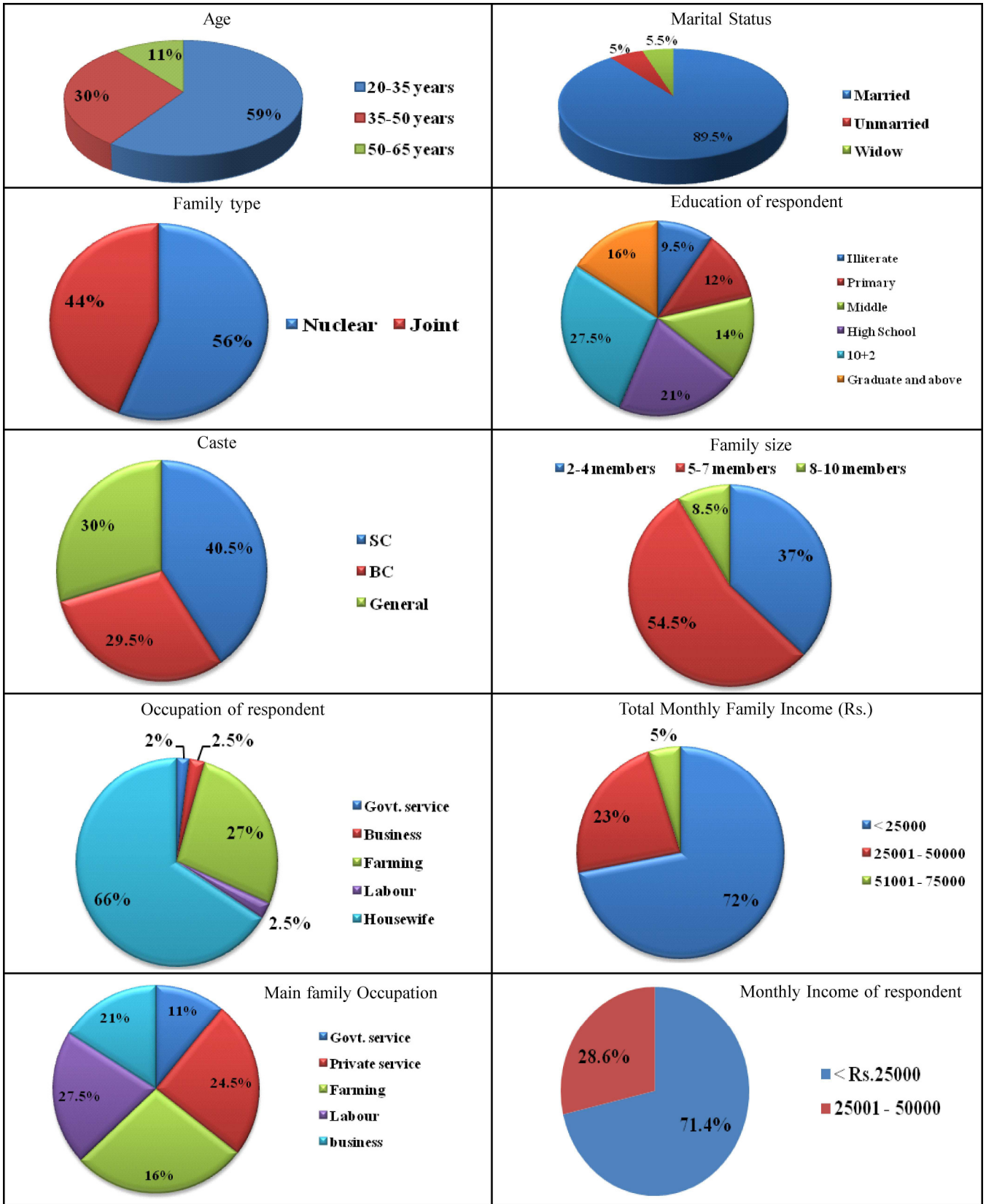

Fig. 1 : Background profile of the respondents

(M.S. = 0.22), which was significant at the 5 % level of significance. One of the easiest and most efficient ways to pursue sustainability, according to researchers, is to adopt energy-efficient household appliances (Sorrell, 2015; Zhou and Yang, 2016).

The mean knowledge scores of participants about different kinds of lighting equipment before and after knowledge was given to them are shown in the Table 3. In order to ascertain the statistical significance of the observed changes, it highlights the knowledge gain and the corresponding z-values. Solar lanterns, solar lights and bulbs, LEDs, CFLs and tube lights are among the lighting equipment taken into consideration. The maximum gain in knowledge was found in solar lantern (M.S. =0.74) which was statistically highly significant ('z'=16.78) followed by solar light/ bulb (M.S. =0.66) and LED (M.S.=0.62); 'z' values for these aspects were significant at 1% level of significance. In conclusion, the data shows that participants' comprehension of solar-powered and energy-efficient lighting equipment was greatly improved by the knowledge that was offered. Particularly for solar and LED technologies, the consistently high z-values demonstrate to the statistical significance of the observed gains.

The Table 4 shows how participants' knowledge of room cooling equipment changed before and after they were given information. It comes with a solar fan and a solar room cooler. The participants' comprehension of both technologies significantly improved. With a z-value of 13.86, the solar fan's mean knowledge score increased from 1.34 to 2.00, representing a gain of 0.66 and a highly significant improvement. A z-value of 15.19, which also indicates high statistical significance, supported the solar room cooler's gain of 0.70 (from 1.23 to 1.93). These findings imply that participants' awareness of solar-based cooling options was positively and statistically significantly impacted by the information that was presented.

The table 5 reveals how participants' knowledge of solar-powered recreational equipment changed before and after the knowledge was given. The maximum gain in knowledge of respondents was found in case of solar radio/transistor (M.S.=0.82) followed by solar TV (M.S.=0.77); 'z' values for these aspects were highly significant at 1% level of significance.

Table 6 shows how participants' understanding of various solar-powered devices changed after they were given information. The equipment included are the solar water heater/geyser, solar tube well and solar inverter. There was a noticeable increase in knowledge for all three items. The maximum gain in knowledge of respondents regarding miscellaneous equipment was found in case of solar tube well (M.S.=0.72) which was

Table 3 : Gain in knowledge regarding energy conservation equipment for lighting (n=100)

Sr. No.	Equipment for lighting	Knowledge (mean score)			
		Pre- knowledge	Post- knowledge	Gain in knowledge	z- value
1.	Solar lantern	1.21	1.95	0.74	16.78**
2.	Solar light/ bulb	1.34	2.00	0.66	13.86**
3.	LED	1.38	2.00	0.62	12.70**
4.	CFL	1.76	2.00	0.24	5.59**
5.	Tube light	1.66	2.00	0.34	7.14**

**Significant at 1% level of significance

Table 4 : Gain in knowledge regarding energy conservation equipment for room cooling (n=100)

Sr. No.	Equipment for room Cooling	Knowledge (mean score)			
		Pre- knowledge	Post- knowledge	Gain in knowledge	z- value
1.	Solar fan	1.34	2.00	0.66	13.86**
2.	Solar room cooler	1.23	1.93	0.70	15.19**

**Significant at 1% level of significance

Table 5 : Gain in knowledge regarding energy conservation equipment for recreation (n=100)

Sr. No.	Equipment for recreation	Knowledge (mean score)			
		Pre- knowledge	Post- knowledge	Gain in knowledge	z- value
1.	Solar TV	1.20	1.97	0.77	18.20**
2.	Solar radio/ transistor	1.16	1.98	0.82	22.79**

**Significant at 1% level of significance

Table 6 : Gain in knowledge regarding miscellaneous energy conservation equipment (n=100)

Sr. No.	Miscellaneous equipment	Knowledge (mean score)			
		Pre- knowledge	Post- knowledge	Gain in knowledge	z- value
1.	Solar water heater/geyser	1.07	1.78	0.71	15.56**
2.	Solar tube well	1.28	2.00	0.72	18.20**
3.	Solar inverter	1.31	2.00	0.69	15.50**

**Significant at 1% level of significance

Table 7 : Gain in knowledge regarding fuel saving vehicles (n=100)

Sr. No.	Vehicles	Knowledge (mean score)			
		Pre- knowledge	Post-knowledge	Gain in knowledge	z-value
1.	CNG vehicle	1.31	1.70	0.39	7.95**
2.	Electric/ battery operated scooty	1.66	2.00	0.34	7.14**
3.	Electric/ battery operated rickshaw	1.64	2.00	0.36	7.46**

**Significant at 1% level of significance

statistically highly significant ('z' = 18.20) followed by solar water heater/geyser (M.S.=0.71) and solar inverter (M.S.=0.69); 'z' values for these aspects were significant at 1% level of significance. These findings show the knowledge dissemination was successful in increasing knowledge and comprehension of the different solar-powered technologies utilised in households as well as agriculture.

The Table 7 demonstrated how participants' knowledge of environmentally friendly cars changed before and after they were given information. CNG vehicles, battery-powered rickshaws and electric/battery-powered scooters are among the vehicles covered. The maximum gain in knowledge of respondents was found in case of CNG vehicle (M.S.=0.39) which was statistically highly significant ('z'=7.95) followed by electric/battery operated rickshaw (M.S.=0.36) and electric/battery operated scooty (M.S.=0.34); 'z' values for these aspects were significant at 1% level of significance. These findings imply that participant's awareness of sustainable and clean transport options increased as a result of the information presented.

Summary and Conclusion:

According to the study's findings, the majority of respondents (59.5%) belonged to the 20–35 age range, 89.5 per cent were married, 56.0 per cent of families were nuclear and had 5-7 people, or 54.5 per cent and 27.5 per cent had completed up to 10+2. The majority of respondents (40.5%) belonged to a scheduled caste, 66.0 per cent were housewives, 71.4 per cent had a monthly income less than Rs. 25,000, and 72.0 per cent had a total monthly family income less than Rs. 25,000. Regarding equipment for cooking, maximum gain in knowledge was found about solar dryer (M.S.=0.82). The solar lantern was determined to provide the greatest knowledge gain in terms of lighting equipment (M.S. = 0.74). The solar room cooler (M.S.=0.70) was shown to provide the most knowledge gain in terms of room cooling equipment. Regarding equipment for recreation, maximum gain in knowledge was found about solar radio/ transistor (M.S.=0.82). With regard to miscellaneous equipment, solar tube well was discovered to have the greatest knowledge gain (M.S.=0.72). In terms of fuel saving vehicles, CNG vehicles showed the greatest knowledge increase (M.S.= 0.39). It was found that respondents had very limited understanding of energy-saving devices prior to knowledge transfer. After the information was shared, there was a noticeable rise in knowledge concerning energy-saving techniques. Overall, the data clearly shows that increasing public awareness of sustainable behaviours and renewable energy technology may be achieved through the dissemination of targeted and organised information. These initiatives are essential for encouraging environmentally aware conduct and facilitating the integration of green and safe alternatives into daily life.

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