



OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

CONSCIENTIZING ADOLESCENTS ON ENERGY CONSERVATION - AN INTERVENTION STUDY

Dr. Susan Cherian¹ Dr. N. Kamalamma² Dr. Annie Cherian³

¹ Associate Professor, Department of Home Science, St. Teresa's College, Ernakulam.

² Professor & Head (Rtd.), Department of Home Science, Gandhigram Rural University, Gandhigram.

³ Associate Professor, Department of Statistics, Baselius College, Kottayam.

susancherianstc@gmail.com¹, anniestatbaselius@gmail.com²

Abstract: Acute energy shortage, global warming and water crisis are growing at an alarming rate day by day. The fast pace of urbanization has jeopardized our ecological balance. It is imperative to take necessary steps to curb these negative changes which put the future generation at risk. The study is an attempt to find out the knowledge, attitude and practice of adolescent girls towards energy conservation and the impact of energy education on their knowledge level. The sample consists of 42 adolescent girls. The study found out that education programmes have a great impact on creating awareness among the adolescent girls. Hence, Educational Intervention Module developed by the investigator is valid and suitable for field experimentation in mass contacts.

Keywords: Energy Conservation, Intervention Module, Conscientizing Adolescents, Knowledge Assessment

I. INTRODUCTION

Energy is very essential for every human activity. A world deprived of energy cannot be thought of. The energy used at home can be of non-renewable and renewable. Use of energy in modern life transformed human life from darkness to light. The main source of energy people used today is non-renewable source extracted from fossil fuels.

The fast increase in fossil fuel burning has produced a rapid growth in CO₂ emissions and accounts for over 80% of global anthropogenic greenhouse gas emissions (Akpan and Akpan, 2012). Consumption of energy in our country is increasing at an alarming rate, pushing each of us to energy crisis (Goyal, 2009; Reddy *et al.*, 2009; Cunningham and Cunningham, 2007). India is world's third-largest emitter of carbon dioxide (Miller, 2013; Timperley, 2019) due to increased consumption of fossil fuels (Kohli, 2016). Hence, it is the responsibility of every human being to exercise utmost restraint in use of energy.

The statistical analysis of the electricity consumption data of the urban households in Ernakulam city,

Kerala, revealed that the mean consumption of electricity of the households differed significantly with various associated factors such as type of employment, family income, stage of family life cycle, housing variables like the total floor area and number of rooms in the house (Cherian *et. al.*, 2020). Variations in the climate are also likely to both increase electricity demand for cooling in the summer and reduce consumption of electricity during winter (Akhmat, *et. al.*, 2014); whereas, energy efficiency of equipment used reduces energy consumption (Rahman and Leman, 2017). Awareness should be created among the young generation on these variables which is having a direct impact on energy consumption at household level.

Because of the limited amount of non-renewable energy sources on Earth, it is important to conserve our current supply or use renewable sources so that our natural resources will be available for future generations. For the long transition to a sustainable and renewable economy, the culture and lifestyle of the individuals should change. Every individual should adopt a responsible behavior and be smart consumers to sustain energy for the future generation.

Since man has become heavily dependent on its multifarious uses, the only way to make energy available to all in an optimum way is its conserved uses so that the world can enjoy energy for a longer time. Energy saving cultures can be inculcated in a family by selecting an appropriate target segment of users and imparting the know-how of energy conservation in them. Adolescents were pointed out to be a better target group by the respondents of baseline survey. They are quicker to grasp the concepts of energy management. This informed group can not only be agents of change in their respective households but also can be long living ambassadors for sustaining this pattern. Knowledge is the capacity to acquire, retain and use information and comprehend properly using their experience, discernment and skill. Hence preparing adolescents to a way of sustainability in the twenty first century is daunting but imperative.

II. OBJECTIVES OF THE STUDY

- To assess the knowledge regarding energy conservation practices among adolescent girls
- To inculcate awareness through Educational Intervention Programme
- To evaluate the impact of the educational intervention programme in raising the knowledge level of the adolescent girls

III. METHODOLOGY

The area selected for the study is Ernakulam city. As per 2011 census, 47.72% of the total population of Kerala are from Urban area and Ernakulam is the most urbanized district (68.07%) in Kerala. More over energy consumption in urban areas are found to be more than in rural areas because of the tendency to adopt clean commercial fuels, such as LPG and electricity because of its convenience.

Late adolescent girls of the age group 18 -21 years were selected as the target group. Adolescent girls in the later stage will be an ideal group for this study as they are the future homemakers, who are philosophical and idealistic. They were able to understand, future oriented, plan and pursue long range goals. This group were selected because their intellectual/cognition level will mature and their abstract thoughts will be well established at this time.

Adolescence is the transitional period between late childhood and the beginning of adulthood (Choudhury et. al., 2006). Intervention programmes in this area helps to mentor the young minds to conserve energy at home by changing their attitude, behaviour, and actions towards the environment. 42 college going girls from the final year degree class of various disciplines were selected for the assessment. They are quicker to grasp the concepts of energy management. This informed group can not only be agents of

change in their respective households but also can be long living ambassadors for sustaining this pattern.

Tool used for the study include an intervention module on energy conservation developed by the researcher and a check list for pre and post score assessment. An intervention module is a combination of ICT materials and strategies designed to produce environment friendly healthy behavioral changes among individuals or an entire population through awareness campaigns. A structured checklist for assessing knowledge level of the participants with 30 questions was developed to assess the knowledge regarding energy conservation among adolescent girls. The impact of the education programme was assessed using Paired t – test.

IV. RESULTS AND DISCUSSION

Development of Intervention Module

Intervention Module on was developed after a baseline energy survey in 500 households and an observation study in a sub sample. The survey and observation identified the lacunae in energy conservation among the urban households. To bridge this lacunae, the Intervention Module include various aspects of energy conservation such as introduction to energy, energy sources and their use in the household sector, energy crisis and its effects, importance of energy conservation, familiarizing electricity tariff for domestic connections, conservation in home lighting, conservation of LPG, conservation through right choice and use of household equipment, various renewable energy options for urban households and thoughts related to conservation of energy for the future generation. The prepared tool was standardized and fine-tuned with the help of experts from the field and used for educational programme.

Conduct of the Intervention Programme

The main aim of the programme was to create an awareness regarding household energy conservation among homemakers. The design selected for this study was quasi - experimental design with one target group. The target group consisted of 42 adolescent girls in the age group of 18 -21 years (later period of adolescence). The programme was of two hours duration. The programme consisted of a lecture on energy conservation techniques aided by a power point presentation.

Knowledge and attitudes of the adolescent girls were assessed with a pre and post checklist administered before and after an education programme. The term knowledge enhancement used in this study it refers to the extent to which educational programme for enhancing knowledge on energy conservation has achieved the intended results in terms of

gain in mean knowledge scores as compared using paired t-test.

Impact of the Intervention Programme

The hypotheses formulated for the same are stated below:

H0: There is no difference in the awareness level of the target group before and after intervention. (i.e. the mean score of

the awareness level of the target group is same before and after intervention).

H1: There is a significant difference in the awareness level of the target group before and after intervention. (i.e. the mean score of the awareness level of the target group after the intervention is greater than that of before).

Table 1 depicts the score awarded for pre-test and post-test on the knowledge level among the adolescent girls.

Table 1

Comparison of the test scores of the participants before and after the educational intervention programme

Knowledge aspects	Knowledge level (Score) (n = 42)						
	Pre test		Post test		Enhancement		Paired 't' test Value
	mean	SD	mean	SD	mean	SD	
Awareness regarding conservation techniques in Home lighting	2.98	1.58	5.81	0.51	2.83	1.61	11.29*
Awareness regarding LPG conservation	2.57	1.56	5.88	0.40	3.31	1.49	14.23*
Awareness regarding conservation techniques in the use of household equipment	2.10	1.78	4.93	0.34	2.83	1.74	10.44*
Awareness regarding use of renewable energy	3.36	1.69	5.93	0.26	2.57	1.61	10.23*
Willingness to adopt energy conservation techniques	2.33	0.79	2.90	0.30	0.57	0.77	4.75*

$t(.05, 41) = 2.33$

* Significant at 5% level

The impact of the educational programme is assessed with a paired t-test. The result of the t-test shows that there is significant increase in the knowledge level with respect to all the five aspects considered when tested at 5% level of significance.

The results show that there is a significant variation in the knowledge level of the respondents on energy conservation with respect to all the five aspects considered when tested at 5% level of significance. The mean post-test score was significantly higher than the mean pre-test score. Hence, the study reveals that interventions to improve knowledge level of adolescent girls on energy conservation have mostly positive effects. The t-test values indicate that the Educational Intervention Module developed by the investigator is valid and suitable for field experimentation.

V. CONCLUSION

The score awarded for the pre-test result shows that there was substantial lacunae in the knowledge of the adolescent girls on energy conservation. The education programme with help of ICT materials improved the knowledge level of the adolescents according to the analysis using paired t- test. The enhanced scores on knowledge level of the target group were found due to the positive influence

of training modules used in the intervention programme. Hence, the study can be concluded that short duration trainings programmes need to be organized at school/college level to enhance the practical knowledge of adolescents on sustainable resource management.

REFERENCES

1. Akhmat, G, Zaman, K, Shukui, T and Sajjad, F (2014) 'Does energy consumption contribute to climate change? Evidence from major regions of the world', Renewable and Sustainable Energy Reviews, Volume 36, Pp : 123-134.
2. Akpan, U. F and Akpan, G. E (2012) 'The Contribution of Energy Consumption to Climate Change: A Feasible Policy Direction', International Journal of Energy Economics and Policy, Vol. 2, No. 1, Pp: 21-33.
3. Cherian, S, Kamamma, N and Cherian, A (2020). 'Variables Associated With Electricity Consumption in Urban Households', Purakala, Vol-31-Issue-14-April-2020.
4. Choudhury, S, Blakemore, S.J and Charman, T (2006) Social Cognitive Development during Adolescence, Social Cognitive and Affective Neuroscience, Vol 1 (3) Pp: 165-174, doi: 10.1093/scan/nsi024

5. Cunningham, W. P and Cunningham, M.A (2007) Principles of Environmental Science, Inquiry and Applications, Tata McGraw-Hill Publishing Company Limited, New Delhi.
6. Goyal, K.K (2009), Renewable Energy, Mahaveer& Sons, New Delhi.
7. Kohli, N (2016) India's looming power crisis growing concern, The Economic Times, https://economictimes.indiatimes.com/indias – looming – power – crisis – growing -concern/toshibashow_dp/50263822.cms.
8. Miller, R (2013) “Role of an Energy Manager”, Presented at the U.S. Department of Energy Industrial Technologies Program retrieved from https://energy.gov/sites/prod/files/2013/11/f4/webcast_20100701_role_energy_manager.pdf
9. Rahman, K.A and Leman, A.M (2017). Energy Consumption Analysis Based on Energy Efficiency Approach: A Case of Suburban Area, MATEC Web of Conferences. 87. 02003. 10.1051/mateconf/20178702003.
10. Reddy, B.S, Assenza, G.B, Assenza, D and Hasselmann, F (2009) Energy Efficiency and Climate Change, SAGE Publications India Pvt. Ltd., New Delhi.
11. Timperley, J. (2019). The Carbon Brief Profile: India, retrieved from <https://www.carbonbrief.org/the-carbon-brief-profile-india>