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RESEARCH ARTICLE

KNOWLEDGE ON "RAINWATER HARVESTING" AMONG HOUSEWIVES' OF URBAN COMMUNITY, NELLORE

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ABSTRACT

Introduction: Water was once considered as a non-limited resource. Due to factors such as population growth and climate change, the shortages of this once referred to, non limited resource are becoming increasingly evident. The total volume of water in the world remains constant.
Objectives To assess the level of knowledge on rainwater harvesting among house wives of urban community Nellore To find the association between the knowledge score on rain water harvesting and selected demographic variables of house wives of urban community in Nellore. To develop and distribute an information booklet on rainwater harvesting methods to the housewives of urban community in Nellore.
Material and method: The present community based cross- sectional study was conducted in urban community, at Nellore, Andhra Pradesh state(India). The study sample included 150 house wives are selected by convenience sampling technique.
Results and Discussion: Results shows that majority of the housewives 106 (70.7%) were having moderately adequate knowledge and 26 (17.3%) were having inadequate knowledge level and 18 (12%) housewives had adequate knowledge level.
Conclusion : The existing knowledge level of house wives was found inadequate

INTRODUCTION

Living creatures of the universe are made of five basic elements, viz., Earth, Water, Fire, Air and Sky, Obviously, water is one of the most important elements and no creature can survive without it. Despite having a great regard for water, we seem to have failed to address this sector seriously. Human being could not save and conserve water and it sources, probably because of its availability in abundance. But this irresponsible attitude resulted in deterioration of water bodies with respect to quantity and quality both. Now, situation has arrived when even a single drop of water matters. However —Better late than never", we have not realized the seriousness of this issue and initiated efforts to overcome these problems.
Water was once considered as a non-limited resource. Due to factors such as population growth and climate change, the shortages of this once referred to, non limited resource are becoming increasingly evident. The total volume of water in the world remains constant. What changes is its quality and availability. In terms of total volume, 97.5% of the world's water is saline with the remaining 2.5% being fresh water of which not all of it is readily accessible to humans. Approximately 75% of freshwater is contained in ice caps, with a further 24% located underground as groundwater, which means that 1% of the total freshwater is found in lakes, rivers and the soil .So although there appears to be a lot of water about, there is in reality very little which is readily available for use by humans. Every day each one of us uses between 160 and 180 liters of water. It is vital not only for cooking and of course drinking, but for washing clothes, dishes, personnel hygiene, for flushing toilets, watering the garden and many other uses about the home. The single most valuable commodity that we all require is water and yet it is the one we take most for granted. In the developed world we expect to be able to turn on the tap and have as much water as we want when we want. Not only that, we expect it all to be clean and safe to drink.

Rainwater harvesting is the accumulating and storing of rainwater for reuse before it reaches the aquifer. It has been used to provide drinking water, water for livestock, water for irrigation, as well as other typical uses. Rainwater collected from the roofs of houses and local institutions can make an

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important contribution to the availability of drinking water. It can supplement the subsoil water level and increase urban greenery **.**Rainwater harvesting is the process of augmenting the natural filtration of rainwater in to the underground formation by some artificial methods. "Conscious collection and storage of rainwater demands water, for drinking, domestic purpose & irrigation is termed as Rainwater Harvesting." System of collection rainwater and conserving for future needs has traditionally been practiced in India. The traditional systems were time-tested wisdom of not only appropriate technology of Rainwater Harvesting, but also water management systems, where conservation of water was the prime concern**.** Rainwater harvesting is an easy and highly effective way to capitalize on the extreme shifts in weather patterns we are experiencing and help alleviate the demand for water. During the rainy season that can be used during droughts. By capturing water on a 1500 square foot roof, a family could reduce their water bill by 50% and save 43,000 gallons of water yearly.

In some cases, rainwater may be the only available, or economical, water source. Rainwater harvesting systems can be simple to construct from inexpensive local materials, and are potentially successful in most habitable locations. Roof rainwater may not be potable and may require treatment before consumption. As rainwater rushes from your roof it may carry pollutants, such as mercury from coal burning buildings, or bird faeces. Although some rooftop materials may produce rainwater that would be harmful to human health as drinking water.

As rainwater may be contaminated due to pollutants like microscopic germs etc., it is often not considered suitable for drinking without treatment. However, there are many examples of rainwater being used for all purposes — including drinking — following suitable treatment. Rainwater harvested from roofs can contain human, animal and bird faeces, mosses and lichens, windblown dust, particulates from urban pollution, pesticides, and inorganic ions from the sea (Ca, Mg, Na, K, Cl, SO4), and dissolved gases (CO2, NOx, SOx) . The concentration of these and other contaminants are reduced significantly by diverting the initial flow of water to waste. The water may need to be analyzed properly, and used in a way appropriate to its safety. There are several types of systems to harvest rainwater, ranging from very simple home systems to complex industrial systems. Rain Water Harvesting involves a number of different things, including storage for later consumption, or immediate use. Depending upon the soil conditions and type of building, there can be many variations to the RWH design. The simplest design consists of collecting the rainwater from the building roof-top, ground level surfaces, filter it through a chamber of bricks and sand, then using a percolation pit, and recharge the underground. Prior to this, we can fill up available wells, baby wells and sumps with water for immediate consumption.

Need For The Study

The term rainwater harvesting is being frequently used these days; however, the concept of water harvesting is not new for India. Water harvesting techniques had been evolved and developed centuries ago.

Rainwater harvesting is an easy and highly effective way to capitalize on the extreme shifts in weather patterns and alleviate the demand for water. With much in drought conditions, the idea of just keeping the water that already falls on our houses is an obvious solution to water scarcity problems. Surface water is inadequate to meet our demand and we have to depend on ground water. Due to rapid urbanization, infiltration of rain water into the sub-soil has decreased drastically and recharging of ground water has diminished. Construction activity in and around the city is resulting in the drying up of water bodies and reclamation of these tanks for conversion into plots for houses. Free flow of storm runoff into these tanks and water bodies must be ensured. The storm runoff may be diverted into the nearest tanks or depression, which will create additional recharge. Rainwater harvesting technologies are simple to install and operate. People can be easily trained to implement such technologies, and construction materials are also readily available. Rainwater harvesting is convenient in the sense that it provides water at the point of consumption, and family members have full control of their own systems, which greatly reduces operation and maintenance problems. Running costs, also, are almost negligible. Water collected from roof catchments usually is of acceptable quality for domestic purposes. As it is collected using existing structures not specially constructed for the purpose, rainwater harvesting has few negative environmental impacts compared to other water supply project technologies.

Depending upon household capacity and needs, both the water collection and storage capacity may be increased as needed within the available catchment area. An article about‖ rainwater harvesting‖ which highlights that rainwater harvesting has been used from ancient times and now, explains that, Rainwater harvesting has been used since biblical times. It was done in ancient Palestine, Greece and Rome. Around 3rd Century BC., farming communities in Baluchistan and Kutch used it for irrigation. In Ancient Tamil Nadu, India, Rainwater harvesting were done by Chola kings.

Rainwater from Brihadeeswarar Temple was collected in Sivaganga tank. At the time of the Indus Valley Civilization, at Elephant Caves and Kanher Caves on the outskirts of Mumbai, rainwater harvesting alone was able to supply all their water requirements. And now currently in China and Brazil, rooftop rainwater harvesting is being practiced for providing drinking water, domestic water, water forlivestock, water for small irrigation and a way to replenish ground water levels. Gansu province in China and semi-arid north east Brazil have the largest rooftop rainwater harvesting projects ongoing. In Bermuda and in U.S. Virgin Islands, the law requires all new construction to include rainwater harvesting adequate for the residents. The United Kingdom water butts are often found in domestic gardens to collect rainwater, which is then used to water the garden. In Beijing, some housing societies are now adding rain water in their main water sources after proper treatment.

Objectives of the study

1. To assess the level of knowledge on rainwater harvesting among house wives of urban community Nellore.
2. To find the association between the level of knowledge on rain water harvesting and selected demographic variables of house wives of urban community in Nellore.
3. To develop and distribute a information booklet on rainwater harvesting methods to the housewives of urban community in Nellore.

Assumptions

1. Housewives may have some knowledge regarding rain water harvesting.
2. Housewives may be able to understand the benefits of rain water harvesting system.
3. House wives may show interest to share their knowledge on rainwater harvesting by answering the questions.
4. Information booklet may be a motivating factor for housewives in selected urban community to implement rainwater harvesting at their houses.

METHODOLOGY

Research approach: A quantitative research approach was utilized.

Research design: A descriptive research design was adapted.
Setting

A study was carried out in selected urban community , Nellore, A.P

Population

The present study population comprises of house wives living in urban community, Nellore, A.P.

Sample

The sample for the present study consists of house wives living in urban community , Nellore, A.P..

Sampling

Non probability convenience sampling was employed to selecta sample.

Sample size The sample size consists of 150 house wives

Criteria for selection of samples

Inclusion criteria

The Housewives

- Who are available at the time of data collection
- Who come under the selected community
- Who know to read and write Telugu

Exclusion criteria

The Housewives

- Who are not willing to participate in the study
- Who have attended any education programs on rainwater harvesting
- who are practising rainwater harvesting system at home

Development of tool

After an extensive review of literature and discussion with experts, the structured knowledge questionnaire was prepared

Section A: Socio –Demographic variable

Demographic data consist of 8 items include age, education, religion, family income, type of family, own or rent house, previous knowledge on rain water harvesting and source of information.

Section B: Knowledge Questionnaire

It consists of 31 items on knowledge on rain water harvesting among housewives. The items were developed to cover different areas such as introduction (6 items), meaning of rain water harvesting (3 items), government implications (7 items), techniques and designs (11 items), precautionary measures (4 items).

Plan for data analysis

The data analysis was planned to include descriptive and inferential statistics.

Descriptive statistics

Frequency and percentage distribution were used to analyze the socio-demographic variables of the patients and their level of knowledge. Mean, mean percentage and standard deviation was used to assess the knowledge of the respondents.

Inferential statistics

Chi square test were used to analyze the association between socio demographic variables and level of knowledge of the housewives

RESULTS AND DISCUSSION

The analysis of data is organized and presented under the following sections.

Section A: Description of demographic variables of housewives

Section B: Knowledge status of the housewives

A. Aspect wise assessment of knowledge scores of housewives on rainwater harvesting system.
B. Overall assessment of knowledge level of housewives on rainwater harvesting system.

Section C: Association of knowledge scores with selected demographic variables of housewives.

Table 1 Frequency and percentage distribution of house wives based on age. (n=150)

Age in years	Frequency(f)	Percentage (%)
18-32	63	42
33-47	43	28.7
48-62	26	17.3
Above 62	18	12
Total	150	100

Table 1 reveals that with regard to age among 150 house wives, 63(42%) belongs to 18-32 yrs , 43(28.7%) belongs to 33-47 yrs, 26(17.3) belongs to 48-62 years,18(12%) belongs to above 62 yrs

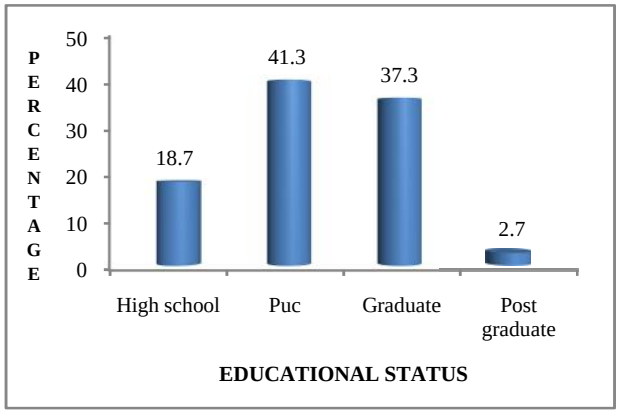

Figure 2 Percentage distribution of house wives based on education

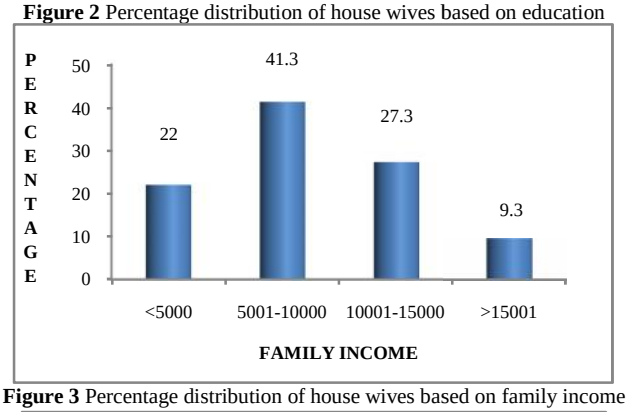

Figure 3 Percentage distribution of house wives based on family income

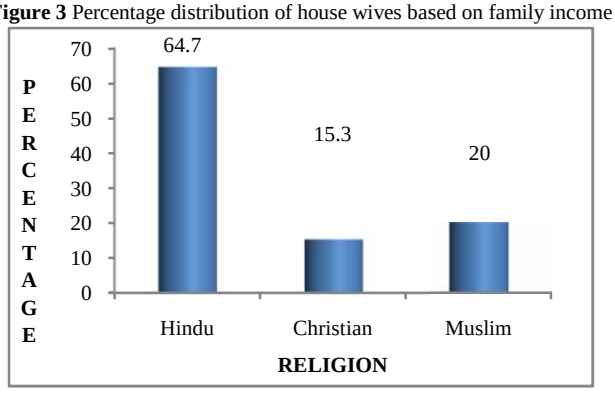

Figure 4 Percentage distribution of house wives based on Religion

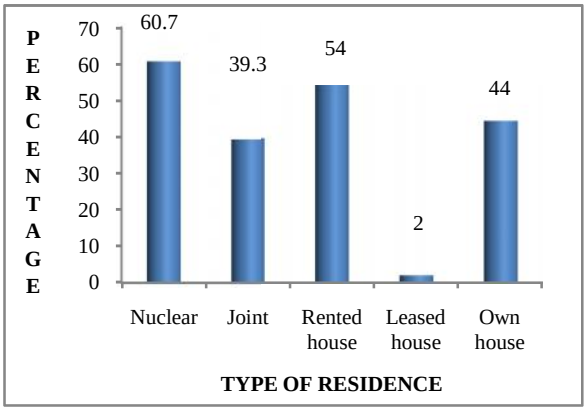

Figure 5 Percentage distribution of house wives based on type of residence

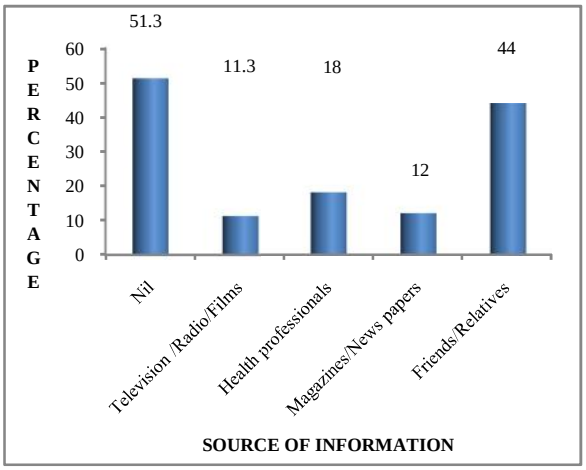

Figure 5 Percentage distribution of house wives based on source of information

Table 2 Frequency and percentage distribution of house wives based on Previous knowledge. (n=150)

Previous knowledge	Frequency(f)	Percentage (%)
Yes	73	48.7
No	77	51.3
Total	150	100

Table 2 reveals that with regard to age among 150 house wives,73(48.7%) had previous knowledge on rain water harvesting system,77(51.3%) had no knowledge on rain water harvesting system

Section B

Table 3 Frequency and percentage distribution of housewives knowledge level on rainwater harvesting system (N=150)

Level of knowledge	Frequency(f)	Percentage(%)
In adequate	26	17.3
Moderately adequate	106	70.7
Adequate level	18	12
Total	150	100

The results of the study revealed that majority 70.7% of the housewives had moderate knowledge 17.33% had inadequate knowledge and 12% of them had adequate knowledge regarding rain water harvesting.

Section C: Association of knowledge scores with selected demographic

variables of housewives

The results indicates that there is no significant association between knowledge and demographic variables of the housewives like age, education, family income, religion, type of family, residence, any previous information, source of information
etc.

CONCLUSION

The existing knowledge level of house wives was found inadequate

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