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Energy Conservation Awareness and Behaviour among Students: Faculty of Medicine Sabratha as a Case Study

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Abstract:
Libya facing high consumption and production patterns that do not achieve economic sustainability. Universities have high-energy waste due to a lack of energy awareness and inefficient use of energy among students. Energy education of the younger generation who are the future decision-makers. Energy-saving efforts need to be taken to reduce the negative effects of higher energy consumption and greenhouse gas (GHG) emissions have continued to rise. Therefore, without knowing the level of energy awareness and energy-use behaviour, it is difficult to plan and provide a better energy conservation program.
The purpose of this research is to identify the level of energy-saving behaviour- awareness and to determine the main important factors that contribute to energy saving among students in faculty of medicine sabratha. Data were gathered using a survey questionnaire on approximately 80 full-time students. The results indicated that students have a low level of energy awareness and behaviour. In addition, results shows that increasing the level of energy awareness enhances energy-use behaviour for respondents. For achieving the third objective of the study (new electricity appliances & social media) have the top of the important factors contribute to energy saving. Energy saving is one of the most necessary options towards the reduction of energy consumption.

Keywords: Energy conservation, Behaviour- Awareness, Faculty of Medicine Sabratha, Students.

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1 INTRODUCTION

Libya seeks to highlight how to achieve sustainable development, and perhaps one of the most important challenges faced is the current energy consumption and production patterns do not achieve economic sustainability [1]. Extended from that [2] states, "the production and use of energy should not endanger the quality of life of current and future generations and should not exceed the carrying capacity of the ecosystem." One of the methods to achieve energy sustainability is through raising of energy awareness. Awareness is the seed for tomorrow's changes [3]. It is the first step in achieving energy efficiency and energy conservation.

A study conducted by [4] revealed that students' behaviour is the major contributor to a large amount of energy wastage at the University of Putra Malaysia. Another study carries out by [5] at University Technology Malaysia reported, that majority of the community did not practice good energy conservation behaviour. Thus, results from previous studies showed that energy conservation behaviour is still low. Hence, there is a need to identify the reason behind low energy conservation behaviour, especially among students. The emphasis on students is relevant as they will grow and develop to become future consumers responsible for environmental sustainability and stewardship [6]. Energy conservation is necessary to reduce energy consumption at universities [5, 7]. This paper attempts to find out the level of energy awareness and energy-use behaviour among students in the Faculty of Medicine. Samples of 69 respondents from the Faculty were randomly chosen in the

survey.

1.1 The Significance of Improving Energy Awareness at University

Energy awareness is an essential factor of energy conservation programs at Universities that will not succeed if students are complacent and take campus energy use for granted [8]. Explains the several reasons, why raising energy awareness and improving energy-use behaviour in universities are important [9]. Universities have a large number of energy users compared to industries and, therefore, the human factor is critical to energy conservation. Raising energy awareness among students will lead them to be more conscientious about energy saving in future. Most of the energy systems embedded in the faculty facilities such as air-conditioning systems and lighting still operated manually and, thus, recommending ways for students to use them effectively is imperative. Since a faculty is an educational institution, training on energy saving can be more effectively implemented. Behavioural improvement is more possible among students than other people [10]. The possibility of saving (5 - 10) % of the energy expenditure through improving energy-use behaviour [11].

2 RESEARCH METHODOLOGY

The main purpose of this research survey is to gather data at a particular time, with the intention of students achieving energy saving. The study took place in August 2021. Results were gathered from a survey questionnaire on approximately 69 full-time students (Faculty of medicine sabratha). The study respondents consisted of 14 male and 55 female students. To achieve current energy-use behaviour and energy awareness among students in the faculty, a questionnaire survey was carried out.

2.1 Questionnaire Survey

The questionnaire consists of four parts. Section (A) the demographic background of respondents. Personal information requested includes the age and gender of the respondent.

Section (B) was designed to measure existing energy awareness, and knowledge, fifteen questions were divided into, seven multiple-choice, eight (True-False- Don't know), and questions were designed to evaluate energy awareness among students. For each question, respondents were asked to select only one answer. One point was given for each correct answer.

Section (C) of the questionnaire was designed to determine energy-use behaviour and consisted of thirteen questions to which respondents revealed their peer's energy-saving behaviour (e.g. "Do you embrace the habit of you turn off lights when there is nobody in the room or daylight is available?"). The rationale for such questions was to avoid presumably threatening or blaming questions on respondents (e.g. "Do you accept the habit of the turn off the computer when it's not being used?"), that will possibly invite false answers.

Section D was designed to identify the main important factors that contribute to energy-saving behaviour and awareness among Medicine Faculty students. A five-point likert response scale from "strongly agree" to "strongly disagree" was used in measuring each construct. Positive statements related to some main factors that may contribute to energy saving in the Faculty of Medicine were designed. For example (Attitude, Individual intention, and Social media e.g.).

3 Results and Discussion

Purpose of achieving these study objectives, 80 questionnaires have been distributed to the target sample of the study that represents in Faculty of medicine sabratha, and 69 questionnaires have been received from the total participants of the study with a rate of 86%. A reliability test has conducted to identify Cronbach's Alpha coefficient; according to Table 1, the collected data have good internal consistency and reliability.

Table 1: Reliability test

Variables	No of Items	Cronbach's Alpha
Energy awareness	15	0.783
Energy-use behaviour	13	0.650
Effective factors	9	0.701

Table (2) shows the demographic profile of the respondents, where the highest gender type is female gender had 80% and (n=55), male gender had 20% and (n=14). For the age categories, the age category (under 25) had the highest percentage of 88.4% and (n=61), the age category (26-34) years had 8.7% and (n=6), age category (35-44) had 2.9% and (n=2).

Table2: Demographic Data

Demographic	Numbers	Percentage of Respondents
Gender		
Male	14	20%
Female	55	80%
Age		
Under 25 yrs	61	88.4%
26-34 yrs	6	8.7%
35- 44 yrs	2	2.9%

Student's awareness and energy conservation

Figure 1 shows the respondent's score of questions has been answered and the total awareness toward energy conservation. Question (eleven), 57 out of 69 (82.6%) students were able to answer the question, this was the highest score of awareness, and the lower correct answer by the students was for question (tree) which scored only 2 of 69 (3%), which revealed a low awareness from the faculty students. A similar result was indicated by [12] the students have low scores on energy issues that between 0.7 % to 58 % for all questions that indicate low of their energy awareness.

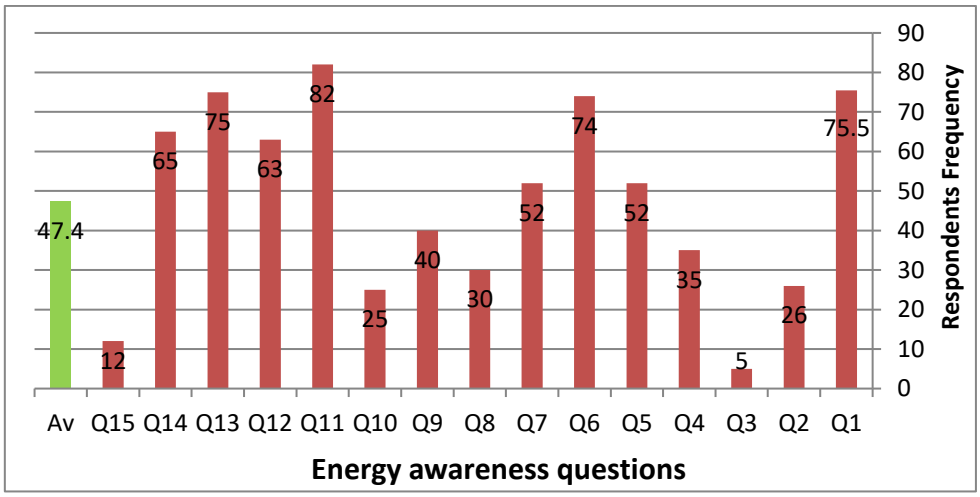

Figure 1: Total Score of Student's Energy Awareness

Respondent's awareness toward energy saving had a mean score of (47.4%) implying that students of medicine faculty had a lack of awareness toward energy saving, as well as a lower level of knowledge. This result is supported by [13,14] students have low awareness about energy issues and energy savings methods, particularly for computers, lighting and air conditioning.

[15] Stated that awareness among the surveyed faculty students is average.

Student's behaviour and energy conservation

Table 3 shows the student's behaviour toward energy conservation. Thirteen questions have been answered by the respondents. Questions were aimed to examine the respondents' energy behaviour toward saving energy consumption. Positive behaviour has been shown by students toward energy conservation in six answers. Seven negative answers had been shown as behaviour toward energy saving.

Table 3: Energy saving behaviour scale

No	Question	Yes	No	Sometimes
1	Do you accept the habit of a turn off the computer when it's not being used?	70%	24%	6%
2	Do you embrace the habit of adjusting the temperature of the air conditioner between 24 -26 °C to maintain comfort level?	56%	40%	4%
3	Do you embrace the habit of you turn off the lights when there is nobody in the room or daylight is available?	79%	14%	7%
4	Do you embrace the habit of setting your computer to safe mode after 10 minutes of inactivity automatically?	35%	50%	25%

5	Do you embrace turning off the lights, air conditioning, and fans in the room for about ten minutes?	32%	60%	8%
6	Do you embrace the habit of considering the energy efficiency label when you purchase electrical appliances?	31%	60%	9%
7	Do you embrace the habit of a turn off the light if the light in the corridor is still on during the daytime?	80%	9%	11%
8	Do you embrace the habit of turning the television or video into standby mode when you leave?	35%	56%	9%
9	Do you embrace the habit of closing the doors and windows when the air-conditioning system is on?	80%	8%	12%
10	Do you embrace the habit of unplugging your mobile phone charger when it is fully charging?	70%	11%	19%
11	Do you embrace the habit of operating the washing machine only at maximum capacity(fully loaded)?	35%	40%	25%
12	Have you shared it with your friends' energy-saving knowledge tips?	21%	66%	13%
13	Do you buy energy-efficient electrical appliances even if it is slightly more expensive?	42%	44%	14%

Figure 2 shows the mean score for energy-use behaviour among students in faculty of medicine Sabratha, 51% implying that students had low behaviour intention toward energy saving. Results indicate that 49% of students did not have good energy conservation behaviour. Similar results indicated by [14] students had a lack of energy conservation behaviour practically, results showed that the university students did not have sufficient energy behaviour to save energy [12]. The energy behaviour of students in the faculty of medicine sabratha is considered at a low level.

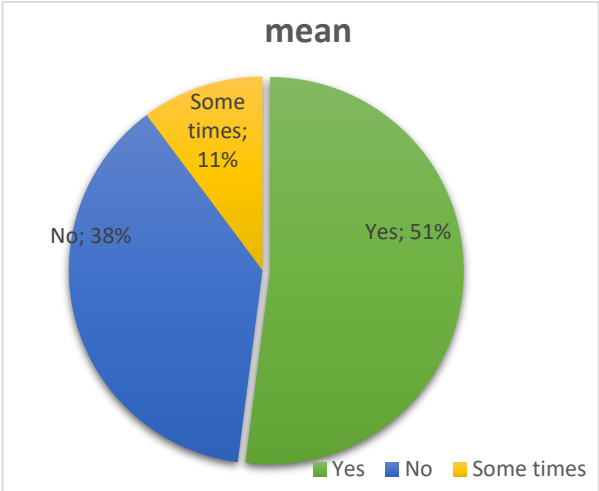

Figure 2: Total Score of energy behaviour

For achieving the third objective of the study, a list of nine important factors has been ranked according to the perspective of Faculty of medicine students. Based on table (4), the New electricity appliances have the top important factors with a mean score of (2.74) that contribute to mitigating energy consumption. The mean score for Social media is (2.22), which has come to be the second factor contributing to energy saving. The rest seven important factors have ranked as follows: Books &Newspapers (2.25), collective cooperation (2.01), energy price & bills (1.95)& (1.87), attitude toward energy saving (1.76), Individual intention (1.67), and the lowest factor contributing is the renewable energy source (1.4). [16] suggested that the government, universities, authoritative institutions and social media, etc. should provide sufficient information about energy savings and encourage the common citizen to form a good habit of saving energy in everyday domestic life. Higher prices encourage consumers to save more energy or to purchase more energy-saving technology [17].

Table 4: Ranking of important factors that contribute to energy saving

Factor	Mean
New electricity appliances	2.74
Social media	2.22
Books &Newspapers	2.25
Collective cooperation	2.01
Energy price	1.95
Energy bills	1.87
Attitude toward energy saving	1.76
Individual intention	1.67
renewable sources	1.4

5. CONCLUSIONS

The results of the survey indicated that students of medicine faculty sabratha have a lake of energy awareness and knowledge about energy conservation methods. The results found students do not have sufficient energy awareness and were engaged in the unsuitable energy-use behavior. Hence low behaviour always leads to large wastage of energy and expensive electricity bill. The results of the third objective of this study have listed of main important factors contributing to energy conservation according to the perspective of medicine faculty students, New electricity appliances have the top of the important factors and the second is social media.

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