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Abstract

The purpose of this study is to explore the current level of contribution of Bahraini women to the engineering fields in the Kingdom of Bahrain, while specifically examining the factors that affect Bahraini women in the engineering profession. This study determines the extent to which the principles and policies of equal opportunity are implemented and their effect on the participation of women in such fields. To achieve the aims of this study, factors such as observation of work environment, characteristics, family responsibilities, culture, and equal opportunity (bias) are discussed and analyzed. This study relies on the descriptive approach, where questionnaires, which were distributed to Bahraini women engineers in both government and private sectors in different positions, are used to collect data. The sample of the respondents was drawn from different age groups and experience levels. The study shows that Arab societies need to support women engineers and try their best to increase the number participating in the engineering fields, which play an important role in the process of economic growth. From the diversity of attitudes and experiences, the status of Bahraini women engineers is not satisfactory at the present time because they must be allowed to participate in the engineering fields equally with their male counterparts in order to improve themselves and their presence and achieve equivalence in engineering fields.

Keywords: Bahraini Women, Engineering Fields, Observation of Work Environment, Characteristics, Family Responsibilities, Culture, Equal Opportunity

Background

Women's participation in the engineering fields nowadays is increasing around the world, and at the same time women are observed to be a minority in these fields. According to Berrais (2010), jobs in Arab countries have developed and grown in science, information technology, technical knowledge, and engineering. The rate of women engineers' participation is still very low, at twenty-five percent of the Bahrain workforce, when compared to the female population, which in Bahrain forms forty percent of the total population (Alayam, 2017; Supreme Council for Women, 2017). This article shows that there are several obstacles that hinder the increase in their participation in the engineering fields.

Choosing a university specialization and making a career decision is the hardest and most important decision in a person's life. Women have more participation in different types of social occasions that affect the culture, economy, and the country's development, which is

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reflected in women's roles in all different sectors. Geertsema (2007) stated that when women are engaged in non-traditional careers such as engineering, it is a challenge for societies to appreciate their capabilities.

Women in the Kingdom of Bahrain have always been portrayed as pioneers by neighboring countries in the region, in terms of educational excellence, gender equality, and professional occupations, among many other factors. The Supreme Council for Woman (SCW) plays an important role in fostering the skills and abilities of women in Bahrain. The Bahrain Economic Development Board (EDB) (2013) states that the SCW "was established in Bahrain in 2001, headed by Her Royal Highness Princess Sabeeka Bint Ibrahim Al Khalifa, to promote the status of women, promote better awareness of their capabilities, ensure that their rights are protected and help tackle problems in different spheres of society."

From the workforce involvement point of view, and according to the Supreme Council for Woman's 2015 report, "the percentage of women's representation of the total Bahraini workforce increased from 4.9 percent to 31.8 percent during the period 1971–2013." This signals an ever increasing and healthy participation of women in the job market, which is also another reason why the present study is significant (Supreme Council for Women, 2015).

We further cite a study that was conducted by Ahmed (2007) about social sciences specifically related to Bahrain in terms of agreeing that women in Bahrain were the first women in the Gulf Cooperation Council (GCC) countries to receive education and to be appointed in senior positions in the country. It is also known in the region that there have been many recent advances in the early 21st century, such as the first woman minister and ambassador (Glosemeyer, 2006).

In an interview in BNA (2017), Her Royal Highness Princess Sabeeka bint Ibrahim Al Khalifa, Wife of His Majesty the King and President of the SCW, "has announced the theme of the Bahraini Women's Day 2017, which will celebrate Bahraini women in the engineering field. She hailed the unlimited support of HM the King to Bahraini women and his appreciation of their role and contributions to all development fields." HRH the Princess stated that Bahraini women have been able to cope with the new engineering specialties and have become a great presence in them, pointing out that Bahraini women have been able to prove their efficiency and resilience in these areas despite difficulties, to reach the proportion of female graduates of this specialization, which is about forty-three percent in the labor market, twenty-five percent in the public sector, and twenty-one percent in the private sector, with a fifty-three percent increase in the public sector, according to the latest statistics of the Civil Service Bureau.

The purpose of this study is to explore the current level of contribution of Bahraini women to the engineering sector in the Kingdom of Bahrain by examining the factors affecting Bahraini women in engineering. This study aims to achieve this by critically discussing the main factors that affect Bahraini working women specifically in this field. These factors involve the observation of work environment, characteristics, family responsibilities, culture, and gender gap. This in turn will be compared and contrasted with the factors impacting issues, such as, but not limited to, effectiveness, productivity, and employability relevant to the Kingdom's engineering sector.

Statement of the Problem

As per our search into the literature that specifically looks into the challenges that affect Bahraini women negatively in terms of working in the engineering sector, we have found that research in this matter is very rare. This article is one step toward revealing opinions to the public, as well as adding to the study of challenges and issues facing Bahraini women in general through the categorization of the workforce in the population. We hope this will lead to improvement in women's employment issues.

Study Questions

The study aims to answer the following questions:

1. Is the engineering work environment suitable for Bahraini women?
2. Do Bahraini women engineers have the right characteristics to lead and work on engineering projects?
3. What are the challenges that Bahraini women face in the engineering field that affect their family responsibilities in the Bahraini culture?
4. How is the Bahraini culture affecting women engineers?
5. Is there a difference between male and female engineers in Bahrain? Is the opportunity to work in the engineering fields dependent on gender?

Objectives of the Study

The research aims to do the following:

- Study the current status of Bahraini women in the engineering sector in both the government and private sectors, and compare the opportunities and offers that are available for men and women in the engineering sector in Bahrain.
- Study and analyze some factors that affect Bahraini women and challenge them to work in the engineering sector, such as their work environment, characteristics, family responsibilities, culture, and gender gap.
- Identify the challenges and a benefit yielded from each factor, deliver a clear conclusion on the current position of women, and recommend future means of advancement and improvement.

Structure of the Study

This study is presented in five sections: this first section has been an introduction to the research problem, study questions, and the objectives of the study; the second section is the literature review, survey, and general information about women in the engineering fields and factors that affect women in the engineering sector; the third section covers the methodology in detail, describing data collection methods and explaining the target population for this research; the fourth section portrays the details of the survey and the data that have been collected and analyzed, and explains the study output and results; and the final section covers the conclusion and recommendations that may have a positive impact for Bahraini women engineers.

Literature Review

The majority of the studies around the world mention that the percentage of women who continue to work in the field of engineering is decreasing due to the obstacles and difficulties imposed by societies in which women are not given the opportunity to prove themselves in engineering disciplines (Frehill et al., 2008; Hill et al., 2010; and Al-Alawi et.al, 2018). The belief in most societies is that women are unable to cope with the external world and especially with the fieldwork involved in the engineering profession, which is considered a "male-dominated" profession. As a result of this belief, Arab societies are unsupportive of women in the scientific fields in general, and in the engineering fields in particular. Nevertheless, a study carried out by the Society of Women Engineers (2006) in Hill et al. (2010) indicated that a retention survey of 6,000 participants or more who graduated with an engineering degree from 1985 to 2003 shows that twenty-five percent of women engineers studied were either unemployed or not employed in an engineering arena, whereas only one-tenth of males who studied engineering had quit the engineering field. Nevertheless, Fouad and

Singh (2011) stated, "The ranks of women engineers have grown from less than two percent of all engineers in the United States in 1978 to nine percent of engineers today."

The controversial question is why there are so few female engineers and why female engineers leave their jobs after years of working in the engineering fields. This paper will answer these questions and will investigate major factors that affect decision-making by females to participate and enter engineering fields, especially for Bahraini women engineers. As mentioned earlier, the women comprise twenty-five percent of Bahraini engineers according to the statistics posted in SCW website (Supreme Council for Women, 2017).

Recently, some studies have noted that women s in engineering careers left their jobs more than women in any other sector. For example, one study shows that, "specific to engineering, the Society of Women Engineers (SWE) reported that one in four women who entered the engineering field have left the profession after age 30, compared to one in ten male engineers" (SWE, 2007). A woman's decision to leave her job is influenced by several factors. The main factors presented in this paper are workplace environment, female characteristics, family responsibility, culture, and gender gap. These factors generally have hindered the success of women working in engineering, leading to the reluctance of most women to work in different engineering fields.

Fouad and Singh's (2011) study shows that in the U.S., "Women are now nearly 20 percent of engineering graduates. However, only 11 percent of professional engineers are women." This study shows that despite the escalating proportion of female graduates from engineering disciplines, their participation is not increasing in the field of engineering work. Of course, there are reasons that affect their decision and lead them to leave that profession that are not related to their capabilities.

The Workplace Environment

The climate of the working environment may be one of the main reasons why women do not feel comfortable in the workplace. One study shows that women engineers feel that their workplace environment is unfriendly because of the observable differences between female engineers and their male colleagues. In addition to the exact aspects of a male-oriented culture that is hostile to women, these are hard to understand because they are inherent in the culture of Bahraini society and difficult to control. On the other hand, the impact of these cultural differences on Bahraini women may create an atmosphere in which they do not want to work, despite their ability to function under the hardest conditions and their desire to engage in a challenging work field, including work in the engineering field.

Fouad and Singh (2011) suggested that some women engineers leave their specialty and work in different fields. They added that some do not enter the engineering field mainly because it is a workplace full of males. As for the women who have left this specialty, one out of three left due to their discomfort in the work environment. It is also worth mentioning that the field of engineering is characterized by a lot of fieldwork that must be done and requires physical strength to do the required tasks. Finally, it is possible to say that one of the most important difficulties facing Bahraini women in the engineering field is the nature of the field work and the pressure of external work while not taking into account their physical nature, leading to lack of job satisfaction, in turn leading to decisions to leave the job. Fouad and Singh (2011) added that the physical needs of women can have a negative impact on their physical and mental functioning.

In contrast to the above, Bahraini women are able to overcome these difficulties and increase their productivity and carry out their work in a leisurely manner, provided that they take into consideration their female nature, not equating them with men in everything, but fairness and the integretation of their needs as women are required.

Characteristics of Women in Engineering

At the present time, Bahraini women are subject to societal challenges in all forms because of the high ambition that they possess, which helps them to promote society and achieve gender equality. In particular, women working in the engineering field face many challenges and difficulties that may force them to opt out from the engineering professions.

The characteristics of women working in the field of engineering in general do not affect their decision to abstain from the profession. Some women with less dominant characteristics find it difficult to continue practicing engineering, to make decisions, to work collectively, and, most importantly, to solve the problems encountered in field work. By contrast, some women, and not a few of them with their strong characteristics, practice the profession, hold leadership positions, and most importantly, are able to work together with men and express their opinions.

Self-confidence is one of the most important factors that helps a woman working in the field of engineering to succeed in her profession, as self-confidence helps her to go into discussions without hesitation and helps her to develop her skills and practical experience; however, self-confidence is not the factor that is resulting in Bahraini women leaving the engineering field.

As mentioned by Duncan and Zeng (2005), personal factors such as self-confidence make a reasonable difference in women engineers' job satisfaction. The more confident they are, the more successful they are.

Family Responsibilities

Bahraini society is almost the same as Arab and Islamic societies where women around the world have a critical, important, and effective position in their families. They are responsible for cooking, cleaning, educating children, and taking care of them. Moreover, they have many social responsibilities to their families that society forces them to participate in and dedicate their time to (Al-Alawi & El Naggar, 2018).

A study done by Menezes (2018) found that women who worked in the profession of engineering admitted that they felt overloaded and found it difficult to manage their home and work life. Moreover, those women engineers claimed that their family role as a housewife is still considered a primary role and remains unchanged, despite their contributing the same amount of income to the family.

Today, many households are hiring domestic staff to help women in taking care of their children and their house; at the same time, the woman is the first person that will be asked if anything goes wrong. Some cooperation between men and women can be found in some households.

On the other hand, the Bahraini government supports women clearly in the labor law of 2012 under "title V", which applies specifically to the employment of women. This law prohibits managers from forcing women to work at night and in dangerous jobs. Some Bahraini women also have the right to take maternity leave for two months to take two daily care hours that the law grants them for two years following the birth of a child in Bahrain (LMRA, 2012).

Some women who are working in STEM (science, technology, engineering, and mathematics) sectors have been forced to leave their academic careers because they cannot balance their duties between work and their family (Hills, 2010, Mason et al., 2009; Xie and Shauman, 2003, Al-Alawi, et al. 2018).

Female engineers can manage their work and family responsibilities more than male engineers, whereas men who are in the beginning of building their families are leaving the engineering sector more than women (Dizikes, 2012). This gives women the right to work in this field while dealing with their responsibilities to their family and society.

Family-work conflict means that home responsibilities can interfere with engineering field tasks because this is a type of job that requires an excessive amount of time and effort to fulfill the responsibilities of the job, which is classified as a time-based conflict. Some studies mentioned that working under high pressure of work and having more responsibilities may lead to some family conflict.

Culture

This is one of the most influential factors impacting women in Bahrain. Our culture expects women to work in specific jobs and restricts them to having careers in teaching and nursing or to being a housewife. On the other hand, the Bahraini government is supporting women in all fields, especially after establishing the Supreme Council for Women in 2001.

Smith and Dengiz (2010) cited that developed countries such as the U.S., United Kingdom, and others in Europe have increased women's participation in studying engineering and have encouraged them to have interest and pride in it so that they can study and work in the engineering field just like men. In Turkey, for example, over the last 75 years, society has shifted from no women working in this field to a field that includes women working in this field more than in Europe and the U.S.

Matthews (2014) reported that Arab countries have worked on increasing the percentage of women who study engineering; for example, in Jordan, women who study engineering accounted for 35.4 percent in 2011. The number of graduated students from engineering, manufacturing, and construction fields, the percentages of graduate women is thirty-four percent in the UAE, twenty-nine percent in the West Bank and Gaza, twenty-seven percent in Lebanon, and 35.7 percent in Malaysia. These percentages show that the Arab and Islamic worlds are working hard to provide the chance for women to prove themselves in the engineering field.

The Gulf countries are in the lead in terms of having the highest ratios in the world of women who work in the field of engineering. In Bahrain, for instance, thirty-two percent of the workforce are females compared with forty-nine percent in Kuwait (Baytiyeh, 2012). Moreover, 40.8 percent of females in Bahrain are employed and do participate in academic fields, and forty-three percent of engineering graduates are women. In the public sector, twenty-five percent of the engineers are women compared to twenty-one percent in the private sector (Baytiyeh, 2012).

Gender Gap (Bias)

The participation of Bahraini women in the field of engineering is increasing according to the statistics described above as mentioned by the Supreme Council for Women on its website, but there is still a big difference between their participation in the field of engineering in all its specialties and the participation of men in the same fields. This is due to the bias of male-dominated societies.

Equality refers to the sameness in terms of allocation of resources and opportunities (Brayboy et al., 2007). Therefore, it is worth mentioning that what is required is equality in all areas of life, especially in the professional fields that include the most difficult professions such as engineering and medicine.

A study that was constructed by the European Social Fund for evolving women engineers indicated barriers that prohibited female engineers from remaining in the engineering field. Those barriers revolved around "cultural stereotypical perceptions of women, women's professional abilities questioned on the basis of their gender, working practices that do not accommodate a concern with work life balance, and lack of access to good career advice" (European union, 2010).

In GCC countries such as Bahrain, such cultural stereotypical attributions are combatted with laws and regulations that highly emphasize justice and equality between males and females in working hours, payments, and promotions. The laws and regulations assure such justice and equality between both genders even on the basis of religion and ethnicity. Their constitutions strive to promote gender equality and assure no discrimination in any of the aspects that are related to the rights of both genders (Seikali, Roodsaz, and Etgen, 2014, Al-Alawi, 2016a, Al-Alawi, 2016b).

Women also face discrimination in terms of occupying leadership positions. There are several organizations that limit their opportunities by hiring only male managers. Some organizations even maintain policies that support gender discrimination in the recruitment process for leadership positions (Al-Alawi, 2016a). Given that managerial positions require aggressiveness and assertiveness, and some board members believe that women do not have such characteristics, this results in discrimination and prevents women from occupying leadership positions (Al-Alawi, 2016a).

In a recent study that was done about business and high-tech industries, it was found that women in these fields have higher attrition rates than do both their male peers and women in other occupations, as mentioned in Elejalde-Ruiz's study (2016).

Heilman et al. (2004) stated that even if women can prove their success and efficiency in these areas, bias may take its course and control these environments. Farenga and Joyce (1999) stated that although biases have changed and narrowed over the last thirty years, science and health areas are now more suitable for women, but yet the engineering profession is still more male-dominated.

Last but not least, the implications of this study are not easy and cannot be neglected. First, they affect women themselves, who may refrain from pursuing science and engineering from the beginning; second, parents may refrain from encouraging their daughters to engage in this field; finally, employers and governmental and private institutions may refuse to recruit females in the fields of science and engineering or may be unfair to them in the annual assessment if they are employees.

In summary, there are many important obstacles facing women engineers in some societies, and there are many reasons behind these obstacles. Furthermore, it is unfair to treat women unequally without any evidence regarding their disadvantages and inefficiencies in the engineering fields, which means that governments and societies must give women engineers a chance by enabling them to prove themselves in the scientific and engineering fields. The main factors studied and highlighted in this study are:

1. Work environment.
2. Characteristics of women engineers.
3. Family responsibilities.
4. Culture.
5. Gender gap or bias.

It is clearly shown that workplace environment plays a very important role in a woman engineer’s decision to stay in or leave the profession. If she finds that the environment is supportive and flexible, it will help her to continue with positive energy and thus will lead to positive outcomes. Just as with culture and gender gaps, the two are interrelated. Unfortunately, most societies still treat women in biased and stereotypical terms in the scientific and engineering fields. Consequently, many negative aspects affect their ability to function and progress in these areas. Regarding the characteristics, the effect is less negative, but stronger characteristics with more self-confidence will lead to more success, as mentioned by some studies. Regarding family-work conflict, it is clear that there is an interface between personal

responsibilities and engineers' work tasks, which creates obstacles for women engineers to continue in this specialization.

Fouad and Singh (2011) stated that the culture factor in the U.S. is one of the main reasons why women do not enter the engineering field, making up only around sixteen percent of engineers, and the family responsibility factor is the highest ranked reason why female engineers left their job in the U.S. These data support our study and answer our questions regarding several affecting factors. At the same time, they suggest that culture and family responsibility affect women in engineering fields all around the world.

Research Methodology

This study analyzes the factors that are affecting Bahraini women who work in the engineering field. Surveys and interviews as both quantitative and qualitative methods were used to collect data from Bahraini women engineers working in the private and public sectors.

This study targets Bahraini women working in the government and private sectors in the engineering field in Bahrain to assess the qualitative factors at play in determining success for Bahraini women engineers. A sample of different age groups, and engineers with different specializations and positions were selected to survey. A total of 100 questionnaires were distributed to women engineers in governmental and private sectors. A sample of fifty-one responses were collected from Ministry of Works, Ministry of Transportation and Telecommunication, Ministry of Interior, Ministry of Housing, and other government and private organizations.

Secondary data were collected from Bahraini governmental organizations such as the Supreme Council for Women (SCW), Central Informatics Organization (CIO), Social Insurance Organization (SIO), Civil Services Bureau (CSB) and from Internet searches, research journals, and newspapers. The primary data were collected by questionnaire.

Open Communications Channe

Open communications channels such as visits, telephone calls, and emails were opened with SCW in Bahrain to identify women's positions in Bahrain in general and especially in the engineering field, where SCW celebrated women in engineering in 2017. In these communication channels, many discussions took place with SCW members about factors affecting women in engineering from their experience and issues they face in their field. The information provided, such as statistics, was of major help in conducting this study.

Questionnaires

The questionnaire is used in this study for its affective method, which saves time, review, and visits, and to get correct data from the targeted group. This method is the best way to collect substantial amounts of data in a short time, and at the same time gives the respondents the chance to express their opinions and suggestions with no inhibitions. The questionnaire was in English, confidential, and sent to participants by email with a link to Google Forms to give the respondent a suitable length of time to respond honestly. This questionnaire was focused on determining the factors that are affecting women in the engineering sector and how adjustment of these factors could change women's working lives.

Questionnaire Design

The questionnaire was designed after studying other questionnaires used in similar studies focusing on women especially, such as those by Al-Alawi (2016) and Mohammaden (2013). The questionnaire was designed in two parts:

1. Personal information about the respondents; e.g., age, marital status, education level, position, and work experience.
2. Factors affecting Bahraini women in the engineering sector; e.g., work environment, women's characteristics, family responsibilities, Bahraini culture, and gender gap (bias).

This summarizes how the study population was chosen and how the questionnaire was designed. The questionnaire method is the major technique for collecting the data for this paper. In this study, only Bahraini women participated in the survey; they were selected from different age groups, engineering specializations, and positions in the engineering sector. In the next section, the results, analysis, and discussion of this survey will be presented to reach this paper's recommendations and conclusion in the last section.

Data Analysis and Findings

The objective of this section is to analyze the data collected from the target group: women engineers working in the public or private sector. Questions were asked about a number of factors affecting women working in the engineering field and the main challenges they face. In this section, the final results will be presented and analyzed for each factor. The questionnaire was prepared electronically through Google Forms. The objective was to distribute the questionnaire to the target group electronically and to analyze the results in a very easy way to minimize the time and effort required to complete the study. The results of the questionnaire and statistics charts are presented in this section in several forms, including graphic representation, charts, and tables. Each result was analyzed separately by using Excel spreadsheets, given that they are very useful in analysing, collecting, and graphing statistics in a way that facilitates user data analysis.

The respondents were asked to choose one of the options given on a Likert scale of 1 to 5 for the level of agreement; e.g., (Strongly Disagree, Disagree, Neither, Agree, Strongly Agree), and for some questions, respondents were asked to tick only one answer.

Background Information

The number of female students in STEM sectors is increasing annually. The University of Bahrain (UOB) admitted 519 female students in its Engineering College, with a percentage of 41.52 percent of total students in the academic year 2016/2017. Moreover, female students were admitted to IT and sciences colleges representing 45.74 percent and 86 percent, respectively. Numbers show that females are almost half the total number of students in UOB, indicating that women are participating in these fields strongly and efficiently (UOB, 2017).

Looking at the Kingdom of Bahrain's population (CIO, 2014), we found that women are forty percent of the total population in Bahrain. This will give them the power and importance in society to work, participate, develop, and reach their goals. In 2014, the numbers were 536,347 females and 844,960 males in Bahrain for a total population of around 1.38 million people.

From the data provided from SCW, Table 1 shows the total number of engineers working in the government sector in Bahrain; thirty-five percent were women engineers, and in the private sector, the figure was twenty-one percent.

Table 1: Percentage of Bahraini Women Working in the Engineering Sector (2017)

Sector	Percentage of Total Engineers
Government Sector	35%
Private Sector	21%

Furthermore, Bahraini women in the engineering fields have been hired in high level positions, which shows that the Bahrain government and society are giving some support to women to be engineers and to work in this field the same as men. Table 2 illustrates that the total number of women engineers in the government sector is 31 percent and 16 percent in the private sector.

Table 2: Percentage of Bahraini Women Working in the Engineering Sector in High Level Positions (2017)

Sector	Percentage of Total Engineers
Government Sector	31%
Private Sector	16%

These statistics show that the private sector is also supporting and encouraging women to enter the engineering field, indicating that women who enter the engineering field do have a chance of improving their knowledge and careers by being in senior and leadership positions.

In 2015, the Bahrain Telecommunication Company appointed Mona Al Hashemi as BATELCO CEO to be the first woman in this position in a private company in Bahrain. However, women in Bahrain still need to be more supported in the engineering fields.

On the other hand, the government sector has more opportunities for women who work in the engineering field to maintain leadership positions. Starting in 2005, many female engineers have proved their capability and efficiency to take these positions and have delivered excellent work with the best management experience. For example, in 2011, engineer Huda Fakhro was hired as Assistant Undersecretary for Roads sector in the Ministry of Works, engineer Mariam Ahmed Jumaan as Undersecretary of Land Transportation and Posts in Ministry of Transportation and Telecommunication in 2013, and engineer Asma Murad as Assistant Undersecretary for Sanitary Affairs in the Ministry of Works in 2016.

A total of 51 Bahraini women engineers responded to this study, which represents 7 percent of the total number of female engineers in Bahrain.

Results of the Questionnaires

As mentioned earlier, this study focuses on the factors that affect Bahraini women working in the engineering fields.

The results illustrated the social status of the participants (Table 3)[6] as well as the percentage of women who work in the government and private sectors (Table 4) in the engineering field. The results also illustrated (Table 5) that a majority of the respondents were civil engineers, at fifty-nine percent (see Appendix A).

Table 6 illustrated that the majority (seventy-two percent) of participants have their Bachelor's degrees; however, fourteen percent have a Master's degree and another fourteen percent have a high school diploma. We note that no woman engineer from the sample has a

[6] Tables 3-8 appear in Appendix A

doctoral degree, which may be because of the women engineers' responsibilities to the family, thus having less free time; or there may be no need for such qualifications for the jobs held (See Appendix A).

On the other hand, Table 7 illustrated that the majority (sixty-four percent) of respondents are in managerial positions; this will give us more accurate numbers and results about the effect of our specific factors in this study on women working in the engineering fields. The table shows that four percent were upper level managers, with eight percent middle level managers, and ten percent line level managers. Nevertheless, fourteen percent chose not to specify their job titles (see Appendix A).

Looking into the respondents' experience, Table 8 demonstrated that forty-five percent of the respondents have experience of less than five years. This indicates and supports the arguments that the majority of respondents are young women engineers, where sixty-three percent are between twenty and twenty-nine years old. Moreover, regarding the years of experience, twenty-seven percent of respondents have five to ten years, while twenty percent have eleven to fifteen years, and eight percent have more than fifteen years of experience. However, Table 9 shows that twenty-five percent of respondents are between thirty and thirty-nine years old, eight percent are between forty and forty-nine years old, four percent are more than fifty years old, and no one is under twenty years old (see Appendix A).

The results of the availability of supporting services for women in their workplace show that around seventy-six percent of respondents confirm that their employers provide separate places for women for prayer, and ninety-four percent indicate that the organization provides separate toilets for men and women. Furthermore, fifty-seven percent of respondents say that their institutions do not provide flexible working hours, and seventy-six percent confirm that separate rest areas are not available for women to relax more comfortably in the workplace. Working from home has a strong proportion with ninety-six percent stating that it is not allowed at all in government and private sectors.

Analysis and Findings

Descriptive statistics of frequencies and percentages were used to analyze the demographic characteristics of the respondents in line with the objectives of the study to conclude the challenges and impact of affective factors on women engineers in Bahrain as follows.

Factor 1: Work Environment

The working environment plays a major role in the employee's success and productivity. For women, the work environment is one of the most important factors affecting productivity and efficiency at work. A number of questions have been asked in the questionnaire for women engineers, which in turn gives us the overall idea of the working environment status for Bahraini women engineers in the public and private sectors. The following tables are the results of the work environment analysis.

Table 11 shows that forty-one percent of the sample size target agrees to a great extent that the nature of women is suitable to work in the engineering field, forty-seven percent agree somewhat, eight percent said the nature of women is not very suitable for engineering fields, and the minority of four percent indicated that the nature of women was not suitable at all.

Table 11: Work Environment Questions and Results

Question	Response Rate			
	Yes to a great extent	Somewhat	Very little	Not at all
Is the nature of women suitable for work in the field of Engineering?	41%	47%	8%	4%
Are some materials and tools used in engineering creating a problem for women?	14%	41%	25%	20%
Are women less receptive to working in an unsafe environment than men?	22%	39%	22%	17%
Are women less likely to work in high temperature weather?	27%	45%	16%	17%
Is travel between work sites unsuitable for women?	14%	29%	18%	39%
Do long working hours affect women's choice of the profession of engineering?	29%	28%	29%	14%
Is evening work inappropriate for women?	61%	21%	10%	8%

Regarding the materials and tools used in fieldwork, it is very clear from Table 11 above that fourteen percent agree that some materials and tools used in the engineering fields cause problems for women, forty-one percent said that to some degree it causes a problem, twenty-five percent claimed that the tools create few problems for women engineers, and twenty percent agree that the tools do not create problems for women engineers at all. It is worth noting that Table 11 shows that twenty-two percent of the women engineers sampled said that women are less receptive to working in an unsafe environment than men to a great extent, with thirty-nine percent somewhat less receptive, twenty-two percent agree to a very low extent, and seventeen percent mentioned that they were no less receptive at all.

As for the weather in Bahrain, it is known that Bahrain is characterized by high temperatures. When asked the question in this regard, the answers are reflected in Table 11: twenty-seven percent of the selected group strongly agreed that women do not prefer working at high temperatures, forty-five percent agree somewhat, sixteen percent supported this only a little, and seventeen percent not at all.

It is common knowledge, of course, that the engineering field requires mobility between several sites in the field, and because the nature of women is different from the nature of men, when opinions were sought as to whether mobility between sites is suitable for women or not, the answer is as follows: fourteen percent supported the view that it is not suitable, twenty-nine percent supported the view that to some extent it is not suitable, eighteen percent that it is not suitable to a small extent, and thirty-nine percent strongly objected to that statement as presented in the Table 11. Similarly, twenty-nine percent of respondents highly support the fact that long working hours affects women in their choice of the engineering profession, twenty-

eight percent supported that to some extent, twenty-nine percent claimed very low support, and fourteen percent did not support this at all.

Finally, Table 11 reflects the extent to which evening work is suitable for women. The results show that sixty-one percent strongly agreed that evening work is not appropriate, twenty-one percent supported this to a certain extent, ten percent agreed that evening work is not suitable for a very small percentage, and eight percent did not agree that evening work is not suited to women at all. Following are the results of the Likert scale level of agreement to the working environment statements (Factor 1), in which 5 is Strongly Agree, 4 is Agree, 3 is Neither, 2 is Disagree, and 1 is Strongly Disagree. Table 12 shows the level of agreement to factor one.

Table 12: Scale Questions and Results Related to the Work Environment Factor

Question	Response Rate				
	Degree of Agreement				
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
The work environment helps you to feel comfortable doing your job and tasks.	19.6%	33.3%	35.3%	7.8%	3.9%
The work environment is flexible enough regarding your needs as women.	7.8%	35.3%	31.4%	19.6%	5.9%
The work environment in your department shows a good interest in women engineers.	27.45%	27.45%	31.37%	11.76%	1.96%
The work environment supports your private needs as women.	15.7%	35.3%	33.3%	5.9%	9.8%

Table 12 shows that 3.9 percent strongly disagreed that employers are willing to adjust the work environment to help women engineers feel comfortable doing their job and tasks, 7.8 percent disagreed to some extent, 35.3 percent were in between, 33.3 percent agreed, and 19.6 percent strongly agreed that it helps them to do their tasks.

Regarding the flexibility of the work environment, Table 12 shows that 5.9 percent strongly disagreed that it is not flexible enough for their needs as women, 19.6 percent disagreed to some extent, 31.4 percent were between disagree and agree, 35.3 percent agreed with that statement to some extent, and finally 7.8 percent strongly agreed that it is flexible enough for their needs.

It is obvious from the results shown in Table 12 that only 1.96 percent strongly disagreed that the work environment in her department shows a good interest in women engineers, 11.76 percent disagreed to some extent with that, 31.37 percent were in between, 27.45 percent agreed to some extent that it shows a good interest, and 27.45 percent strongly agreed that the work environment in their department shows a good interest in women engineers.

The results in Table 12 also shows that 9.8 percent strongly disagreed that the work environment is supportive of their private needs as women, 5.9 percent disagreed with that fact

somewhat, 33.3 percent supported that to a medium extent, 35.3 percent agreed with that, and 15.7 percent strongly agreed that the work environment is supportive of their private needs.

Factor 2: Characteristics

Regarding the characteristics of women engineers, many aspects were mentioned in the questions about measuring the strength of the characteristics of woman engineers and their ability to prove their presence as engineers in their organizations.

Table 13 shows that only eight percent agreed to a great extent that the number of women employees in some engineering fields is due to the lack of their skills and inefficiency, forty-one percent supported that statement somewhat, thirty-one percent supported that very little, and twenty percent did not support that at all. Table 13 also shows that sixty-five percent supported the view that they feel confident about their abilities to achieve their goals and tasks in their departments, twenty-nine percent agreed that they have the ability to achieve their goals, two percent were feeling very little confidence about their abilities, and four percent did not feel confident about their abilities at all.

Table 13: Characteristics Factor Questions and Results

Question	Response Rate			
	Yes to a great extent	Somewhat	Very little	Not at all
Is the number of women employees reduced in some engineering fields' disciplines due to inefficiency and lack of skill?	8%	41%	31%	20%
Are you feeling confident that you have enough ability to achieve your job goals and tasks?	4%	29%	2%	65%
To what extent do you think that you have the characteristics necessary to be able to succeed in engineering fields?	51%	43%	6%	%0
Does your institute help you to feel fulfilled with your characteristics?	27%	45%	22%	6%
Do you have the ability to prove yourself as an engineer in your institute?	72%	20%	4%	4%
Do you feel that women have the ability to face engineering work problems and stresses?	61%	25%	8%	6%
Do you feel that women engineers' characteristics can adapt to the engineering work changes?	61%	33%	2%	4%

Regarding the characteristics scale, Table 13 stated that six percent agreed that they have good characteristics that enable them to succeed in the engineering fields, with forty-three percent having good characteristics, and fifty-one percent excellent characteristics. It is worth mentioning that nobody stated that they have few characteristics.

Table 13 also shows that twenty-seven percent believed their organizations help them to feel fulfilled with their characteristics, forty-five percent supported the idea that their organizations help them to feel fulfilled to some degree, twenty-two percent supported this to

a very small extent, and six percent stated that their organizations do not help them to feel fulfilled with their characteristics at all. This table also shows a good and clear idea about the ability of women engineers to prove themselves, where seventy-two percent agreed strongly that they have the ability to prove themselves in their organizations, twenty percent agreed with that to some degree, four percent agreed very slightly, and four percent did not support the view that they have the ability to prove themselves.

Again, Table 13 illustrates that sixty-one percent strongly supported that they can face engineering work problems and stresses, twenty-five percent supported that somewhat, eight percent supported that to very little extent, and six percent strongly agreed that they cannot face engineering work problems and stresses at all. This table mentioned that sixty-one percent strongly supported that they feel that their characteristics can adopt engineering work changes, thirty-three percent to some extent supported that they can adopt work changes, two percent agreed to a little extent, and four percent could not adopt to work changes at all.

Below are the results of the scale questions related to the women engineers' characteristics. Figure 1 shows that twenty percent strongly agreed that it is easy for women to lead a team, thirty-three percent agreed to some extent, thirty-five percent to a fair degree, eight percent disagreed that it is easy for women to lead a team, and, finally, it is clear that four percent strongly disagreed with that statement.

Figure 1: Level of Agreement on Whether It Is Easy for Women to Lead a Team Successfully—Characteristics

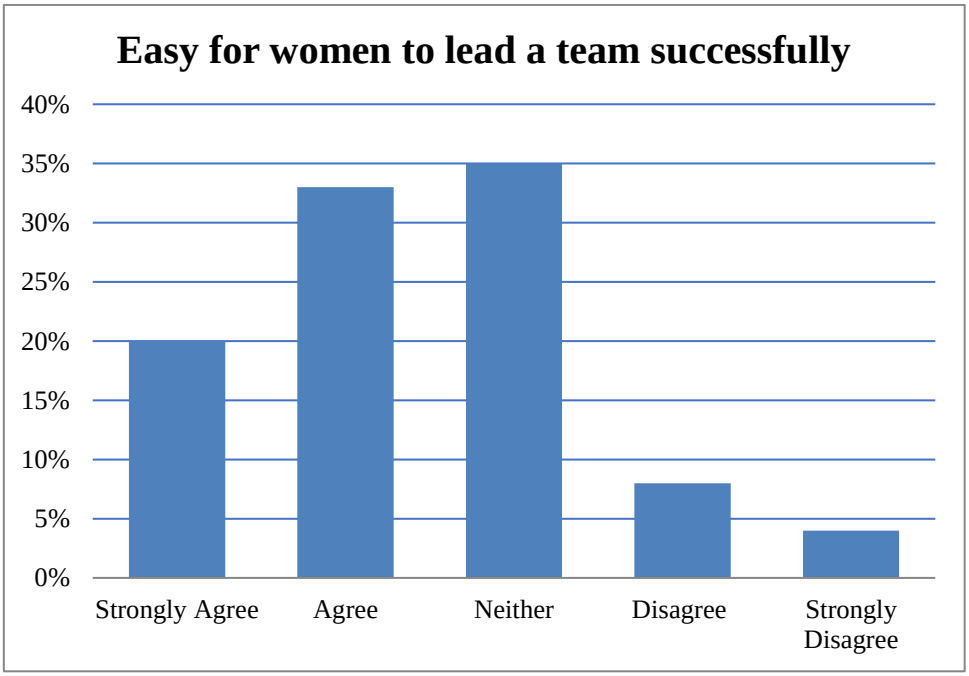

Table 14 below generates an idea about the degree of interpersonal skills, where it is clear that six percent strongly disagreed that women are stronger in interpersonal skills than their male counterparts, twenty percent disagreed somewhat, thirty-one percent held a fair level of agreement about that, thirty-five percent agreed that women are stronger in interpersonal skills, and eight percent were strongly agreed with that fact. The table also demonstrates that women are more persuasive and assertive, where two percent strongly disagreed about that, twelve percent disagreed somewhat, thirty-one percent had a fair degree of agreement that women are more persuasive and assertive, twenty-seven percent agreed with that to a greater extent, and twenty-seven percent strongly agreed that women are more persuasive and

assertive. Table 14 noted also that ten percent strongly disagreed that women are more empathetic and flexible, six percent disagreed somewhat, thirty-three percent agreed to a fair degree that women are more flexible, thirty-five percent agreed with that to some extent, and sixteen percent strongly agreed with that statement.

Table 14: Scale Questions and Results Related to Characteristics Factors

Question	Response Rate Degree of Agreement				
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
It is easy for women to lead a team successfully	20%	33%	35%	8%	4%
Women are stronger in interpersonal skills than their male counterparts	8%	35%	31%	20%	6%
Women are more persuasive and assertive	27%	27%	31%	12%	2%
Women are more empathetic and flexible	16%	35%	33%	6%	10%
Strong characteristics for women engineers helps them to be more successful in their work	49%	0%	37%	6%	8%

Finally, Table 14 supported the claim that stronger characteristics for women engineers helps them to be more successful in their work, eight percent disagreed with that fact, six percent had a fair degree of agreement with that statement, thirty-seven percent agreed somewhat, and forty-nine percent strongly agreed that stronger characteristics helps her to be more successful in her work.

Factor 3: Family Responsibilities

In this section, the questions were focused on the family responsibilities of women engineers. Table 15 below shows the questions answered by the percentage of respondents regarding family responsibility factors.

Table 15: Family Responsibilities Questions and Result

Question	Response Rate			
	Yes to a great extent	Somewhat.	Very little	Not at all
Do women have the ability to balance the demands of work and family responsibilities?	37.25	47.06	15.69	0.00
Do you think that vacations should be increased for a married woman who has young children?	52.94	21.57	13.73	11.76
Do married women with children have low concentration and decreased productivity at work?	9.80	41.18	23.53	25.49
Do women working in engineering adversely affect family stability?	3.92	25.49	31.37	39.22
Do you think that institutions prefer not to hire married women because of their family responsibilities?	35.29	41.18	5.88	17.65
Are married women getting their rights in maternity leave and care hours in your institute?	52.94	35.29	11.76	0.00
Do you think that women are leaving the engineering sector because of their family responsibilities?	11.76	15.69	33.33	39.22
Do you think that such a career path will require too much time or work that will affect your personal life and decisions?	25.49	29.41	19.61	25.49

As shown in Table 15, forty-seven percent of women agree that they have a certain degree of ability to balance between work and family responsibilities, and thirty-seven percent say confidently, 'Yes, we can do it.' Furthermore, fifty-three percent agree that vacations should be increased for a married woman. Unfortunately, forty-one percent agree somewhat that married women will have low concentration and decreased productivity, and ten percent say 'yes' to a great extent.

From another point of view, forty-nine percent think that a married woman will have a decrease in her productivity, very little decrease at twenty-four percent, and not at all at twenty-five percent. Moreover, thirty-nine percent confirm that working in the engineering sector does not affect family stability at all, and thirty-one percent agree that it will affect it very little.

A common belief among both men and women is that, "Institutions prefer not to hire a married woman because of her family responsibilities," and, as expected, thirty-five percent agreed, saying 'yes' to a great extent, and forty-one percent said somewhat.

Looking to Bahraini women's rights in maternity and childcare in government and public sectors, eight-eight percent of women agreed that they are getting their rights, but twelve percent disagreed with that. Furthermore, thirty-nine percent of women indicated that they are not leaving the engineering sector and they can manage their work and family responsibilities.

A similar result was found regarding how career path choices affect Bahraini women's personal life; twenty-six percent agreed that it will affect their personal life to a great extent,

twenty-nine percent somewhat, twenty percent very little, and twenty-five percent not at all. This result is conflicting, indicating that this effect may depend on individual circumstances or the institutional environment.

Factor 4: Bahraini Culture

Culture is always an important factor affecting women in Bahrain, as shown in Table 16.

Table 16: Family Responsibilities Questions and Results

Question	% of Respondents			
	Yes to a great extent	Somewhat	Very little	Not at all
Do you think that the cultural difference between males and females affects the choice of the engineering profession?	27.45	39.22	23.53	9.80
Do you think that your customs and traditions affect the success of your career in your field of engineering?	17.65	35.29	37.25	9.80
Do you think that women are getting their chance to innovate and participate in the engineering sector?	37.25	37.25	19.61	5.88
Do you think that Bahraini culture encourages women to work in the engineering sector?	33.33	50.98	13.73	1.96
Are you facing problems in the work field with your colleagues because of the culture?	1.96	19.61	29.41	49.02
Do you think that your choice of career was a right decision?	64.71	25.49	9.80	0.00
Are you encouraging students to study and enter the engineering field?	64.71	21.57	11.76	1.96
Do you receive negative comments or discouragement about your job?	5.88	31.37	35.29	27.45
Do you feel some pressure from your family members or society to change your job?	0.00	15.69	25.49	58.82
Do you think that Bahraini husbands do not expect their wives to work in the engineering field and prefer them to stay at home?	3.92	13.73	39.22	43.14

As shown in Table 16, twenty-seven percent agreed that cultural differences between males and females affect women to a great extent, and thirty-nine percent found this affects women somewhat. That women engineers' success will be affected by cultural factors to a great extent was believed by only eighteen percent. However, thirty-five percent agreed that cultural differences will only somewhat affect women's successes, and thirty-seven percent said that the effect is very little.

As for women in Bahrain getting their chance to innovate and participate in the engineering sector, thirty-seven percent agreed to a great extent, thirty-seven percent agreed

somewhat, twenty percent agreed very little, and six percent not at all. This is a very good positive result for women's future in engineering.

Moreover, on the positive vision toward women engineers' future, the study found that thirty-three percent agreed that Bahraini culture is encouraging women to work in the engineering field to a great extent and fifty-one percent supported this somewhat. Also, forty-nine percent confirmed that they are not facing any problems at all with their colleagues because of culture. Nevertheless, sixty-five percent of Bahraini women were very confident and happy about choosing engineering as their career to a great extent and twenty-five percent felt this is somewhat true. This reflects another question where sixty-five percent encouraged female students to study engineering to a great extent and twenty-one percent agreed somewhat, whereas thirty-seven percent of respondents were receiving negative comments about their job.

Bahraini culture is again showing its support to women engineers. Table 16 also shows that twenty-five percent of respondents hardly felt that family members and society are forcing them to change their job, and fifty-nine percent were not feeling that at all, which implies that society is supportive and open-minded in its thinking. Bahraini husbands are also supporting their wives working in the engineering field: forty-three percent agreed that their husbands are fully supporting them in their career, and thirty-nine percent hardly felt that their husbands prefer them to change careers. However, we should work on getting full support for women in the engineering field.

Factor 5: Gender Gap and Equal Opportunity

In previous years, the field of engineering did not have female involvement and was a male monopoly for a period of time, but it has recently been observed that the proportion of females in engineering majors is increasing. With regard to the employment stage, which follows the study stage, we explore whether women have the opportunity to prove their presence in these specialties and if there is equality of opportunity between them and males or discrimination still exists. Following are the results of the study related to this point.

When a question was asked of the working engineers whether there was a committee of equal opportunities in their institutions, as shown in Table 17, twenty-three percent said yes, eighteen percent answered no, and fifty-nine percent did not know whether there is a committee of equal opportunity or not.

Table 17: Gender Bias Questions and Results

Question	Response Rate			
	Yes		No	I do not know
	Yes and it is implemented	Yes but not implemented		
Does your institution have an Equal Opportunity Committee in order to ensure that the principle of equal opportunities is being implemented?	23%		18%	59%
Do your institution's regulations and by-laws include special policies/procedures for implementing the principle of equal opportunity and mainstreaming women's needs?	57%	17%	12%	14%
Does your institution have clear and documented criteria for selecting the members of the board of directors (BOD)?	14%	10%	15%	61%
Does your institution reflect or state the principle of equal opportunities, the board of directors (BOD) policies, procedures and selection criteria?	10%	12%	12%	66%
Do you think Arab societies disagree with women being engineers and consider the engineering field as a male dominated division?	12%	24%	33%	29%

Another question was asked about whether the laws and regulations in their organizations have procedures to insure equal opportunities and mainstream women's needs. In response, fifty-seven percent stated they do not know whether there is an implemented procedure or not, seventeen percent assured that yes, there is a procedure, and it is implemented, and twelve percent said yes there is a procedure, but it is not implemented. And fourteen percent they said no, there is not.

Table 17 shows that fourteen percent agreed that their employers have clear and documented criteria for selecting the members of the board directors, and these are implemented, ten percent agreed that they have criteria, but it is not implemented, fifteen percent agreed that they do not have a procedure, and sixy-one percent they do not know it they have a procedure.

From the same point of view, it is noted that ten percent agreed that their organization reflected the principle of equal opportunities, board of directors policies, and the selection criteria and these are implemented, twelve percent confirmed that their organizations stated the principles and policies but they are not implemented, twelve percent answered no, and sixty-six percent said they do not know whether the principles are stated and implemented.

In the past, women engineers were not common in Arab societies and there was a monopolization of engineering specialties by males. It is worth mentioning that when the question was asked for women engineers in this regard, the answer was surprising; as shown

in Table 17, only twelve percent supported this view, twenty-four percent supported it somewhat, thirty-three percent said they supported that view very slightly, and twenty-nine percent did not support the idea that males monopolize engineering disciplines in Arab societies at all.

Related to the scale questions, Table18 shows that fifty-one percent strongly agreed that most organizations in both sectors prefer to employ men rather than women in engineering fields, twenty-five percent agreed with that to some extent, twenty percent answered with moderate approval, four percent disagreed to some extent, and none strongly disagreed.

Table 18: Gender Bias Questions and Results

Question	Response Rate				
	Degree of Agreement				
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Most organizations in both sectors prefer to employ men rather than women in engineering fields.	51%	25%	20%	4%	0%
Women are changing their career from engineering to other disciplines because of the differentiation of males and females in this sector.	8%	18%	37%	25%	12%

When the question arises whether women engineers change their careers to disciplines other than engineering because of the distinction between men and women, the answer is clear in the above findings, which stated that twelve percent strongly disagreed, twenty-five percent disagreed to some extent, thirty-seven percent had a fair agreement, eighteen percent agreed, and eight percent strongly agreed with that statement.

Summary of the Results

Our questionnaire was for Bahraini women working in the engineering field in both government and private sectors. Our respondents were fifty-one in total. We worked with this data and analyzed it to find the effect of some factors on Bahraini women engineers, such as work environment, characteristics, family responsibility, culture, and gender gap.

Our sample was from different institutions such as Ministry of Work, Ministry of Transportation, Ministry of Interior, and Electricity and Water Authority. The sample was seventy-one percent from government sector, with sixty-seven percent married women. Furthermore, most (fifty-nine percent) of them were civil engineers, seventy-two percent of the total sample have a Bachelor's degree, and sixty-four percent of the respondents were in middle-management positions with experience of less than five years and were between twenty and twenty-nine years old.

The respondents confirmed that their institutes provide them with private toilets and prayer rooms; however, only four of them have the opportunity to work from home.

Work Environment

Regarding the work environment, results were mixed; however, the vast majority confirmed that their work environments were reasonably well suited to them. Conversely, 47.1 percent agreed somewhat that the nature of women is suitable to work in the engineering fields, but 41.2 percent supported to some extent the idea that the tools and materials used in such

fields create problems for women. As mentioned earlier, Bahrain is a country characterized by high temperatures, and 45.1 percent agreed that they are less likely to work outdoors for field work in high temperature weather.

In contrast, 39.2 percent did not report that travel between work sites is not suitable for women at all. On the other hand, there is a discrepancy of opinion as to whether long working hours affect women's choice of engineering majors, where 29.4 percent agreed to a great extent and 29.4 percent agreed to a very little degree. It is worth mentioning that there is very strong support (60.8 percent) for the idea that evening work does not suit women.

Among respondents, 35.29 percent had reasonable and fair agreement that the work environment helps them feel comfortable doing their assigned tasks, and in turn 35.29 percent agreed to some extent that their work environment is flexible enough for their needs. As well, 54.9 percent agreed to some extent and 27.45 percent strongly agreed that their departments show a good interest in women engineers. Also, 35.29 percent agreed to some extent that their work environment supports their personal needs.

Characteristics of Women Engineers

The findings on the characteristics of women engineers were surprisingly positive, where only 41.2 percent agreed somewhat that the number of women engineers is decreasing due to lack of skills and inefficiency, 51 percent strongly supported that they have excellent characteristics for success in engineering fields, 45.1 percent agreed somewhat that their organization helps them to feel fulfilled with their characteristics, 64.7 percent strongly agreed that they are confident about their abilities in achieving their goals, 72.5 percent strongly supported that they have the ability to prove their presence in their workplaces, and 60.8 percent agreed that women engineers have the ability to face work stresses and adapt to work changes.

Also, the results show that 45.09 percent strongly agreed that it is easy for women to successfully lead a team, 37.25 percent agreed somewhat that women are stronger in interpersonal skills than their male counterparts, 35.29 percent agreed somewhat that women are more persuasive and assertive, another 33.33 percent agreed that women are more empathetic and flexible, and, in contrast, the statement that the stronger characteristics a woman has, the more successful she will be in her work was strongly supported by 49.02 percent.

Family Responsibilities

The results show that family responsibilities are not affecting Bahraini women strongly, where eighty-four percent of Bahraini women confirmed that they can manage between their work and family responsibilities and seventy percent of women agreed that an engineering career does not affect their family responsibilities. Moreover, seventy-two percent of women agreed that family responsibility is not the factor that forces women to leave the engineering field.

The study shows that seventy-six percent of women engineers are seeing that institutions prefer not to hire women because of their family responsibilities and maternity leave. Eighty-eight percent of women engineers in Bahrain are getting their rights in maternity leave and care hours, and this will increase the amount of leave and vacation for the married engineer to seventy-four percent. Unfortunately, fifty-one percent of women agreed that their family responsibilities will decrease their concentration and productivity in work.

Bahraini Culture

From a positive point of view about Bahraini culture, we found sixty-six percent of women agreed that Bahraini culture is supporting them and does not differentiate between male

and female, and forty-seven percent of women disagreed that culture and tradition will affect women's success negatively in their engineering career.

Women are getting their chances, with seventy-four percent innovating and participating in engineering careers in Bahrain. Also, eighty-four percent say that Bahraini culture encourages women to work in engineering fields. This cultural support is reflected in women's opinions in this field where they think that they made the right decision in studying engineering by ninety percent, and, at the same time, eighty-seven percent were encouraging female students to study engineering.

In the workplace, seventy-eight percent of women engineers were not finding any problems with their female colleagues, and sixty-three percent were not receiving any negative comments about their job. Also, eighty-four percent of women said that they are not feeling any pressure from society to change their career, and eighty-two percent said their Bahraini husbands are not forcing them to leave the field.

The Gender Gap and Equal Opportunities

Most of the results in this section were answered with 'I know': 58.8 percent said they do not know whether there is a committee of equal opportunities in their organizations, 56.9 percent also did not know if they implement the principles of equal opportunity, 60.8 percent did not know if there are clear and documented criteria for selecting members of the board of directors, 66.7 percent did not know if their organizations reflect the these principles and procedures; and from a positive point of view, 33.3 percent supported very little the idea that Arab societies disagree with women being engineers.

In contrast, 51 percent strongly agreed that most organizations in both sectors prefer to employ men rather than women in engineering fields, with 37.3 percent having a fair level of agreement that women change their jobs from engineering to another discipline because of this bias.

Summary, Conclusion, and Recommendations

This section is a summary of the data collection results, findings of the research, conclusion, and recommendations. This section will highlight which factors are affecting Bahraini women in engineering fields and how we can support them in facing these challenges. At the end of this section, we recommend some topics for other papers to continue from our study and reach more accurate and detailed results that may help Bahraini women engineers.

Summary

This study was designed to discuss the most important factors, which are work environment, women engineers' characteristics, family responsibilities, culture, and gender bias, that may affect the success of women working in engineering fields and the potential obstacles to success. The study focused on women engineers working in all engineering fields in both government and private sectors. The purpose of this paper was to study the current status of Bahraini women in engineering fields and compare opportunities and offers that are available for men and women in order to determine the extent to which equal opportunity principles in the engineering profession are implemented, and also to study and analyze some factors that affect Bahraini women and challenge their success in engineering fields, to finally come up with a clear conclusion on the current position of women and recommend future means of advancement and improvement. The study showed that worldwide generally, and in Arab societies especially, there are moves toward supporting women engineers to achieve success in this area and access leadership positions and equality with men engineers.

Conclusion

In conclusion, it is possible to see that Bahraini women constitute the lowest participation rate, which is thirty-five percent in the government sector and twenty-one percent in the private sector, in engineering. As for managerial and leadership positions, only thirty-one percent of engineers holding leadership positions in the government sector are women, and only sixteen percent with leadership positions in the private sector are women. Nevertheless, Bahraini women participated in a reasonable proportion in the engineering fields and achieved leadership and administrative positions, even if these were a small proportion. Moreover, these percentages indicate that Bahraini women were able to prove their value amid many obstacles and difficulties, including many widely-held beliefs. In return, it is necessary to give Bahraini women engineers more opportunities to participate in the process of economic development and to achieve the highest positions.

This study indicated that the factors studied do not significantly affect the success of Bahraini women in this specialization. However, the most important issues include not giving them the opportunities for leadership positions and increasing the percentage of their participation in all engineering fields. As most of the results confirmed, women are able to lead a group successfully, and they believe in their abilities to achieve the objectives of the institution in terms of matters related to the work. It is worth mentioning that the vast majority emphasized that the culture and the responsibilities of women are not a major obstacle to their success. Also, most respondents strongly agreed that the work environment is flexible enough and helps them to feel comfortable, which means that the work environment is not an obstacle to a certain extent.

Based on these demonstrated results, it is possible to say that the problem of unequal opportunities in the institutions, the absence of a clear mechanism for the selection of managers and people who occupy leadership positions, and, most importantly, the lack of knowledge held by the employees, and in particular the Bahraini women engineers, led to a reduction in the proportion of participation of women in the engineering fields but not in the degree of success.

Recommendations

By examining the data analysis and results, the following recommendations were constructed:

1. Based on Bahrain's economic Vision 2030 and the sustainability of the development of Bahrain, women that are led by SCW and women in the engineering sector require support from the Bahraini government to force the ministries to encourage women in this field, develop their skills and knowledge, and give them equal opportunities to reach the highest level positions in Bahrain.
2. Women are facing a challenge in that institutions prefer to hire men rather than women, especially in the private sector. Labor Market Regulatory Authority (LMRA) should consider that and apply some rules supporting women engineers.
3. Enact special laws and policies to support women in Bahrain.
4. Flexible hour systems will be a valid option for married women; it is an easy step for organizations to offer this concession to support their women employees.
5. It is noted that both the government and private sectors do not allow working from home; this is an option in other countries if women (or men) have a reason for it.
6. Provide suitable working hours and force organizations not to expect them to work late into the evening.

7. Establish a committee under SCW responsible for the development of principles of women in engineering sector and other sectors as well, to ensure that they have access to all their rights and have a comfortable environment for work and innovation.
8. Encourage female students to choose engineering fields, and show them examples of successful engineering women in Bahrain.
9. Help women manage family responsibilities, society's requirements, and work duties.
10. Provide a special training program to develop women's knowledge and skills in the engineering field.
11. Develop women engineers' soft skills, such as confidence, decision-making, communication, and interpersonal skills.
12. Establish professional women engineers to hire them later in leadership positions.
13. Market and develop engineering fields by exploiting the benefits women who participate in engineering enjoy to improve this sector in Bahrain.

Recommendations for Further Studies

This study focused on the factors affecting Bahraini women working in the engineering field. Five factors were chosen, studied, and analyzed.

From the data collected, some results need to be specified and investigated in a separate study; for example, this study found very similar results when it asked about the effect of time and work on women's personal lives. These may need to be studied with related factors and with an opportunity created to go back and ask women engineers about reasons and suggestions to solve the issues. Moreover, many other factors can be studied, such as discrimination against women, parents' decisions, social values and prestige, high level positions, and long working hours.

This study was based in theory only; for future research, it is recommended that testing of the factors take place based on the institutions and analysis of the data for each. Maybe our questions, if focused only on the government sector or only on the private sector, would get different results. This could be done by targeting one bank or ministry and studying it in relation to the number of female engineers working in that institution.

Comparing the engineering fields with STEM sectors will have a beneficial result in studying the position of women in Bahrain. Moreover, studying some related factors together may focus on problems and challenges that are facing Bahraini women in this field. It will be an important future study if the Bahrain Engineering Society helps to support women engineers in Bahrain in coordination with the Supreme Council for Women.

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Appendix A

The following section includes detailed data that have been gathered that involve information such as the social status, workplace, background, qualifications, job titles, and years of experience of the respondents.

Table 3: Social Status of Respondents

Social Status	Response Rate
Single	29
Married	67
Divorced	2
Widow	2

Table 4: Workplace of Respondents

Workplace	Response Rate	
Government	71	
Private	29	

Table 5: Engineering Background of Respondents

Engineering Background	Response Rate
Civil Engineering	59
Mechanical Engineering	2
Chemical Engineering	2
Electrical Engineering	12
Computer Engineering	10
Telecommunication Engineering	2
Architecture	10
Others	4
Total	100

Table 6: Qualification of Respondents

Qualification	Response Rate
Doctoral Degree (Ph.D.)	0
Master's Degree (M.A.)	14
Bachelor's Degrees (B.A.)	72
Diplomas	14
Others	0

Table 7: Job Title of Respondents

Job Title	Response Rate
Upper Level Manager	4
Middle Level Manager	8
Line Manager	10
Under Manager	64
Other	14

Table 8: Years of Experience of Respondents

Years of Experience	Response Rate
< 5 Years	45
5-10 Years	27
11-15 Years	20
>15 Years	8