

## Challenges Faced by Palestinian Women in Electrical, Electronic and Computer Technology and Engineering During COVID-19 Crisis

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**Abstract**— The outbreak of coronavirus disease 2019 (COVID-19) in the occupied Palestinian territories underpins the adverse effect on public health due to shortages in health-care equipment to contain the spreading. The vulnerable communities amongst women, elderly and children are mostly impacted. Palestinian women endure additional burdens associated with paid and unpaid work, often without consideration or the alleviation of other life responsibilities. With the fact that electrical, electronic and computer technology and engineering is a fast growing, vibrant and promising sector in Palestine, this paper hence assesses the challenges faced by the Palestinian women in this sector during COVID-19 crisis since they also play important roles in upbring the sector. Via literature review, questionnaire survey on 141 respondents and data analysis via IBM Statistical Package of Social Sciences (SPSS) V27, it is found that the top 3 most critical challenges faced by the Palestinian women in electrical, electronic and computer technology and engineering are stresses, followed by limited freedom of movement, anxiety about the future and struggling to stay motivated. The findings of this paper reveal the reality behind gender inequality amongst the Palestinian women in electrical, electronic and computer technology and engineering during the COVID-19 pandemic, who instead should be empowered since women involvement in the economy has proven to cause a multiplier effect across all other development areas.

**Keywords** - Palestine, women, electrical, electronic and computer technology and engineering, challenges, COVID-19

### I. INTRODUCTION

The respiratory viral infection of corona virus (COVID-19) was first spread in Palestine on 5 March 2020, specifically in the West Bank [1], from a group of Greek tourists who visited Bethlehem in late February, with two later diagnosed with the virus [2]. With the current spike in COVID-19 cases, both in the West Bank and the

Gaza Strip [3], it is apparent that Palestinian capacity for emergency response is significantly reduced by the Israeli military occupation and turmoil in the economic situation.

As recorded in many countries, the COVID-19 pandemic is expected to disproportionately affect the Palestinian women, create and exacerbate pre-existing gender-specific risks and vulnerabilities and widen inequalities. This is proven that although with differences in power, privilege and opportunity, women are often the first responders to a crisis, and they play a central role in the survival and resilience of families and communities [4].

In Malaysia for example, a study on challenges of women in Science, Technology, Engineering and Mathematics (STEM) shows that the top three most important challenges during the COVID-19 are limited freedom of movement, stress due to attending house chores while at the same time has to work from home as well as increased health problems due to non-ergonomic work behaviours [5]. This is further supported by [6] who stated that disease outbreak or other crises increase women's workloads and decrease ability to balance their time among spheres. For Palestinian women who undertake paid employment, managing these multiple responsibilities has become increasingly difficult. Although the male heads of households are expected to assume the shopping for essential family needs under the COVID-19 related restrictions, this does not alleviate the women's reproductive burdens. A feminist perspective

highlights the men’s actions as abiding to state instructions as opposed to authentic generosity.

However, amidst the COVID-19 pandemic, the electrical, electronic and computer technology and engineering sector is playing a significant role in upscaling the Palestinian nation, as the ICT industry in Palestine helps eliminate geographical barriers that restrict free movement and the exchange of information. In the Palestinian context, the electrical, electronic and computer technology and engineering sector has abundance of chances to grow and expand despite the many challenges and restrictions imposed by the Israeli occupation as the data on the labour force for 2018 revealed that those holding university degrees in the electrical, electronic and computer technology and engineering sector field had an opportunity to find work at a rate of 79% in the West Bank and 89% in the Gaza Strip [7].

Hence, this paper is undertaken with the aim of assessing the challenges faced by the Palestinian women, specifically in electrical, electronic and computer technology and engineering during COVID-19 crisis. The findings of this paper are expected to open the eyes on gender inequality while at the same time empowering Palestinian women in electrical, electronic and computer technology and engineering amidst the COVID-19 pandemic. This is apparently in line with the United Nation Sustainable Development Goal SDG 5 on achieving gender equality and empowering all women in accelerating sustainable development as discrimination against women has a multiplier effect across all other development areas [8].

## II. LITERATURE REVIEW

This section generally discusses the current scenario of COVID-19 crisis in Palestine and the states of Palestinian women’s life throughout this deadliest pandemic. Also discussed is the contribution of electrical, electronic and computer technology and engineering to the Palestinian economy in highlighting the important roles of Palestinian women in electrical, electronic and computer technology and engineering amidst the COVID-19 pandemic. Finally, the challenges faced by Palestinian women in general are elaborated.

### A. Palestine and COVID-19

The COVID-19 pandemic is believed to be originated from the Huanan South China Seafood Market, which has brought down almost every nation’s economy [9], including Palestine. This COVID-19 pandemic outbreak, challenging, unpredictable scenarios, economic consequences and catastrophic social effects is also known as a black swan event that caused “unknown unknown” [10]. Together with the ongoing blockade imposed on land, air and sea, the COVID-19 crisis has had a dreadful impact on the health and wellbeing of residents in Palestine.

Even before the COVID-19 outbreak, forecasts for the Palestinian economy in 2020 and 2021 were already depressing, with Gross Domestic Products (GDP) per capita anticipated to decrease by 3% to 4.5% [11]. High poverty and unemployment rates remained and GDP per capita declined for the third consecutive year as the Palestinian economy continued to slide in 2019 and the first half of 2020 [12]. In general, since the outbreak of COVID-19 pandemic, Palestine has recorded a sudden surge of COVID-19 positive cases as Israeli illegal occupation and deprivation of Gaza and West Bank have limited the ability of Palestine to treat infected patients, let alone face the COVID-19 pandemic [12]. This is proven when the COVID-19 cases in Palestine have shown that as of 23 October 2020, 49,134 cases have been recorded [13] with the majority infected being male aging between 18 and 50 years old as illustrated in Fig. 1.

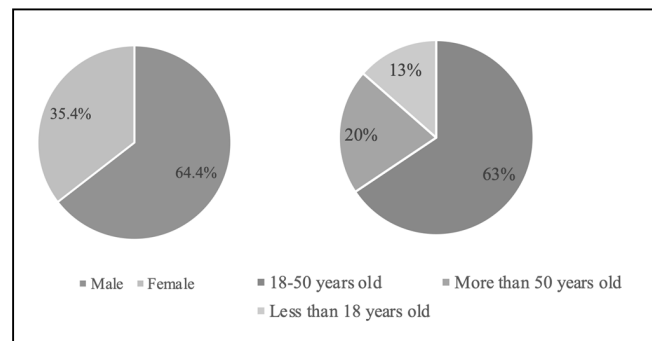


Figure 1. Distribution of infected COVID-19 cases in Palestine by sex and age [13]

Lockdown measures to control the spreading of this communicable virus amongst Palestinians, decline in donor support due to that they

themselves are also struggling against the COVID-19 pandemic, besides, the poorer economic performance have worsened the fiscal condition with significant increase in unemployment rate and poverty [12].

### B. Palestinian Women during COVID-19 Crisis

In countries all around the world, on top of limited freedom of movement, many women face additional professional workloads simultaneously with their current house chores due to the COVID-19 lockdown measures. As in Palestine, gender stereotypes are more apparent as at the initial stage of the emergency declaration in March by the Palestinian government followed with the lockdown measures, only female employees with children working in the public sector were relieved of their professional duties to take care for their children. This is due to the stereotyping mindset that the women are to be caregivers, whilst men are the breadwinners [15].

Later, even when all non-essential government employees, both male and female were asked to stay home, the burden of domestic work are still being largely dropped on women. There is also a notable increase in child care needs that stems from closings of schools and daycare centers, which this impact is the most severe for single mothers, who outnumber single fathers by a large margin.

In worsening the situation, since both women and men are working from home, men's salary is prioritised more than that of women, where 68 per cent of Palestinian women have reported increased unpaid care work since the pandemic [16]. Due to these weakening economic conditions with decrease of salary, loss of jobs and anxiety of contacting with COVID-19 virus, there is deterioration in the economic situation of women, leading to economic violence in the home and also higher rates of domestic violence in Palestine [17].

Although many of the other challenges faced by the Palestinian women during the COVID-19 crisis are not literately available, based on the experience of other publicly published experience of women around the globe, other challenges that might be faced by the Palestinian women could be due to reduced ability to provide remittances due to the salary cut as well as lack of social protection and health care [18]. All of these collected challenges,

with a total of 29 challenges or factors are summarised in Table 1 based on four constructs of financial, healthcare, career and domestic challenges as proposed by this paper.

TABLE I. CHALLENGES FACED BY WOMEN DURING COVID-19 CRISIS [15][16][17][18]

Challenges Based on Construct	
<b>Construct 1: Financial Challenges</b>	
1	Reduced salaries
2	Reduced ability to provide remittances e.g. to parents, siblings etc
3	Reduced financial independence
4	Reduced future financial prospects
5	Deferred salary payment
6	Increased utilities bill
<b>Construct 2: Healthcare Challenges</b>	
1	Heightened risks of contracting COVID-19
2	Lack of social protection
3	Lack of health care
4	Anxiety about the future
5	Struggling to stay motivated
6	Stresses
<b>Construct 3: Career Challenges</b>	
1	Increased health risk due to non-ergonomic working behaviours e.g. using laptop for long hours
2	Higher rates of job losses
3	Increased workload due to lack of social supports from husband and family
4	Increased workload due to company downsizing
5	Poor productivity
6	Conflict amongst colleagues at work
7	Lack of infrastructure for working from home e.g. quiet space, Wi-Fi etc
8	Increased Israeli's occupation movement restriction constraining job progress
9	Israeli measures causing slow job performance
<b>Construct 4: Domestic Challenges</b>	
1	Attending house chores while work from home
2	Managing home-schooling
3	Increased taking responsibilities e.g. elderly, children etc
4	Limited freedom of movement
5	Increased exposure to domestic violence
6	Distraction from family members while work from home
7	Lack of social interaction
8	Unable to unplug from work

### C. Contribution of Electrical, Electronic and Computer Technology and Engineering to Palestine Economy

Like any other technology and engineering professionals, the electrical, electronic and computer technology and engineering contributed significantly to the Palestinian economy. It is claimed as a fast growing, vibrant and promising sector worthy of attention at all levels as the data science largely used in the sector is also known as the "oil of the 21st century" [7].

This is evident as there has been a large expansion in fixed network infrastructure, accompanied by its increased use and related

services, especially the use of Internet services and asymmetric digital subscriber line (ADSL) subscribers with 469,741 telephone lines (home, commercial and governmental) in Palestine at the end of 2018 compared to 360,402 at the end of 2010 with an increase of 30%, as well as 361,000 ADSL subscribers at the end of 2018 compared with 119,000 ADSL subscribers at the end of 2010, with an increase of 202% as in Fig. 2 and Fig. 3, respectively [19]. Also, the contribution of electrical, electronic and computer technology and engineering sector on the Palestinian Gross Domestic Product (GDP) is illustrated in Fig.4.

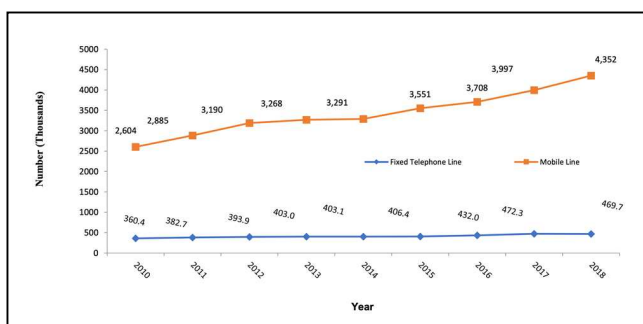


Figure 2. Total number of fixed and mobile lines in Palestine [19]

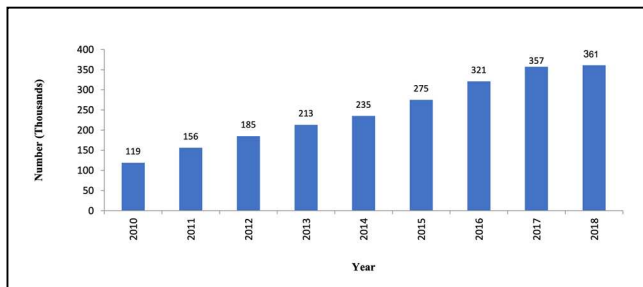


Figure 3. Total number of ADSL subscribers in Palestine [19]

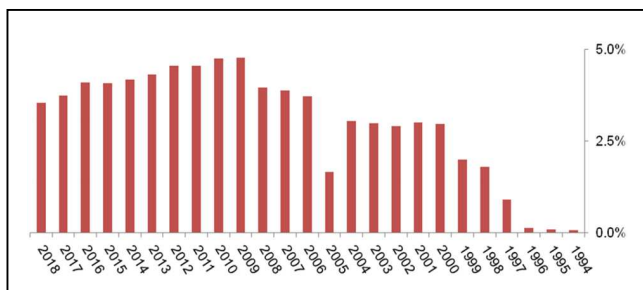


Figure 4. Gross Domestic Product (GDP) of electrical, electronic and computer technology and engineering sector in constant prices between 1984 and 2018 [19]

### III. RESEARCH METHODOLOGY

This paper initially started with the literature review on the general challenges faced by the Palestinian women during COVID-19 crisis via reputable journals, thesis, reports, prospectus, books etc. These secondary data collected are used in developing the questionnaire survey, a systematic method of gathering information from a target population amongst the Palestinian women in electrical, electronic and computer technology and engineering due to its common usage amongst the researchers [20].

As Likert scale is used for the questionnaire survey, this paper adopts five-point Likert scale of agreement [21] based on the direct experience of the respondents. The anticipated respondents are selected amongst the Palestinian women in the electrical, electronic and computer technology and engineering, where due to limited access to related databases and numbers, the population of Palestinian women in the electrical, electronic and computer technology and engineering, especially in Gaza failed to be determined. However, since this paper is descriptive in nature, a minimum of 100 samples is sufficient [22].

Before the questionnaire is distributed to the Palestinian women in the electrical, electronic and computer technology and engineering, this survey undergoes a pilot study. Based on the suggestion that a pilot study sample should be minimum 10% of the sample projected [23] to test the validity, reliability and internal consistency of the questions [24], 19 respondents are invited to participate in the pilot study. The result of analysis shows that the Cronbach's alpha is 0.872, which indicates that excellent internal consistency is recorded [25] hence valid to be used further for the actual questionnaire survey.

The questionnaire is subsequently disseminated to the Palestinian women in the electrical, electronic and computer technology and engineering via online platform, where 141 are successfully collected and valid. The analysis are subsequently undertaken via IBM Statistical Package of Social Sciences (SPSS) V27.

### IV. RESEARCH FINDINGS

The demographic data of the 141 respondents is illustrated in Fig. 5. It shows that majority of the

electrical, electronic and computer technology and engineering Palestinian women are aged between 25 and 34 years old, originated, residing and working in West Bank during the COVID-19 crisis, having Bachelor Degree, working in engineering sector with less than 5 years of working experience, working both at office and work from home as well as married.

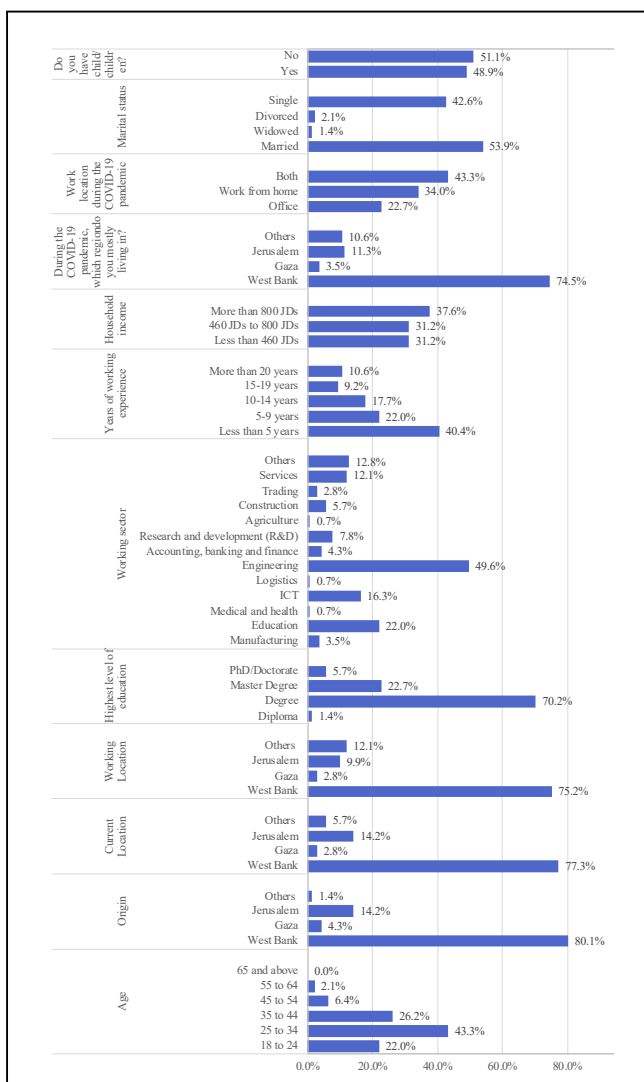


Figure 5. Demographic data analysis of 141 Palestinian women in electrical, electronic and computer technology and engineering participated in the questionnaire survey

In terms of challenges faced by the Palestinian women in electrical, electronic and computer technology and engineering during the COVID-19 crisis, which are initially consisting of 29 factors constructed into four via literature review, namely financial, healthcare, career and domestic

challenges, these challenges are reduced to 18 factors and re-grouped by the analysis into six constructs, namely miscellaneous I, financial challenges, healthcare challenges, miscellaneous II challenges, productivity challenge and career challenges as shown in Table 2.

The reduction to 18 factors from initially 29 factors is due to factor loading records less than 0.60 that is considered as not practically significant [26]. These 18 factors record communalities value more than 0.30 [27] and mean is more than 3.000 [28], which show that these factors are practically valid.

TABLE II. ANALYSIS OF CHALLENGES FACED BY PALESTINIAN WOMEN IN ELECTRICAL, ELECTRONIC AND COMPUTER TECHNOLOGY AND ENGINEERING DURING COVID-19 CRISIS

Factors Included	Factor Loading	Communalities	Mean
<b>Construct 1: Miscellaneous I (average mean = 3.415)</b>			
1. Increased utilities bill	0.630	0.711	3.312
2. Heightened risks of contracting COVID-19 virus	0.681	0.815	3.518
<b>Construct 2: Financial Challenges (average mean = 3.406)</b>			
1. Reduced salaries	0.825	0.768	3.440
2. Reduced ability to provide remittances e.g. to parents, siblings etc	0.771	0.747	3.234
3. Reduced financial independence	0.787	0.836	3.390
4. Reduced future financial prospects	0.630	0.726	3.560
<b>Construct 3: Healthcare Challenges (average mean = 3.341)</b>			
1. Lack of social protection	0.743	0.782	3.383
2. Lack of health care	0.784	0.784	3.298
<b>Construct 4: Miscellaneous II Challenges (average mean = 3.789)</b>			
1. Anxiety about the future	0.657	0.750	3.752
2. Struggling to stay motivated	0.738	0.773	3.681
3. Stresses	0.743	0.819	3.936
4. Limited freedom of movement	0.757	0.810	3.787
<b>Construct 5: Productivity Challenge (average mean = 3.113)</b>			
1. Poor productivity	0.724	0.763	3.113
<b>Construct 6: Career Challenges (average mean = 3.319)</b>			
1. Distraction from family members while working from home	0.637	0.711	3.433
2. Increased Israeli's occupation movement restrictions adversely impact job performance	0.770	0.788	3.270
3. Israeli measures during pandemic adversely impact job performance	0.773	0.781	3.255

In terms of the level of criticality of these challenges impacting the lives of the Palestinian women in electrical, electronic and computer technology and engineering during the COVID-19 crisis, Table 2 also illustrates that the most critical

challenge based on the highest means are stresses, followed by limited freedom of movement, anxiety about the future and struggling to stay motivated. On the other hand, the least critical challenges are poor productivity, Israeli measures during pandemic adversely impact job performance and increased Israeli's occupation movement restriction adversely impacts job performance.

## V. CONCLUSION

This paper has successfully achieved its aim of assessing the challenges faced by the Palestinian women, specifically in electrical, electronic and computer technology and engineering during COVID-19 crisis. It is found that the most critical challenges are stresses, followed by limited freedom of movement, anxiety about the future and struggling to stay motivated. Yet, it was alarming that the literature review and primary data collection by established organisations, namely the United Nation (UN) is dissimilar with the findings of this paper in terms of challenges not currently faced by the Palestinian women, specifically in electrical, electronic and computer technology and engineering during COVID-19 crisis.

The 11 challenges, which are not affecting the Palestinian women are increased health risk due to non-ergonomic working behaviours e.g. using laptop for long hours, higher rates of job losses, increased workload due to lack of social supports from husband and family, increased workload due to company downsizing, conflict amongst colleagues at work, lack of infrastructure for working from home e.g. quiet space, Wi-Fi etc, attending house chores while working from home, managing home-schooling, increased taking responsibilities e.g. elderly, children etc, lack of social interaction and unable to unplug from work.

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