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GENDER DIFFERENCES IN SCHOOLING AND OCCUPATION; SOCIAL AND ENVIRONMENTAL VULNERABILITY

Diferencias de género en nivel educativo y ocupación; vulnerabilidad social y ambiental

Leonela Ramirez Marfil
Teacher, Mexico
(leonela.spp@gmail.com) (https://orcid.org/0000-0002-0500-7004)

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ABSTRACT

Women's labor force participation worldwide is lower than men's, this is directly related to their education level, and it is caused by gender norms, roles and discrimination, which generates social, economic and environmental differences. In this regard, the objective of this study was to analyze gender differences in the schooling and working fields and its possible social and environmental vulnerability in the city of Delicias, Chihuahua, Mexico. 384 surveys were conducted in the forementioned city, with a minimum reliability of 95%, using stratified random sampling divided into levels of marginalization. A descriptive statistical analysis was carried out, showing differences in education and occupational levels by gender in Delicias city, affecting women with notorious disadvantages, increasing their vulnerability, the occupation with the highest percentage in women was housewife and in men it was an employee, affecting women with noticeable disadvantages, which increases their vulnerability. Obtained results represent a starting point for the implementation of social programs aimed at minimizing gender differences in order to reduce their vulnerability, they also contribute to the understanding of gender equity´s importance in society.

Palabras clave:
desventajas, escolaridad, roles de género, vulnerabilidad.

RESUMEN

En todo el mundo la participación laboral de la mujer es inferior a la participación del hombre, lo cual tiene relación con el nivel de estudios, teniendo como raíz las normas, roles y discriminación de género, lo que genera diferencias sociales, económicas y ambientales. En este sentido, el objetivo del presente estudio fue analizar las diferencias de género en nivel educativo y ocupación y su posible vulnerabilidad social y ambiental en ciudad Delicias, Chihuahua, México. Se realizaron 384 encuestas distribuidas en la ciudad, mediante un muestreo aleatorio estratificado dividido en niveles de marginación. Se efectuó un análisis estadístico descriptivo, los resultados mostraron que existen diferencias en nivel de educación y en ocupación por género en Delicias, la ocupación con mayor porcentaje en las mujeres fue ama de casa y en los hombres fue empleado, repercutiendo en las mujeres con desventajas notorias lo que incrementa su vulnerabilidad. Los resultados obtenidos sirven como base para la implementación de programas sociales orientados a minimizar las diferencias de género y reducir su vulnerabilidad, además contribuyen a comprender la importancia de la equidad de género.

Introduction

At present, despite the great efforts of national and international organizations, governmental programs and social groups, and the progress made in gender equality, there are still evident differences in the subject worldwide, but with greater emphasis on Latin America and other regions. Compared to race, age, and occupation, gender represents the strongest category for differentiation among people (Wood and Eagly, 2010). But in society it is not only a theoretical classification, but also entails differences in roles, rights and obligations, as well as opportunities, representing social and economic advantages or disadvantages. Therefore, the effort to minimize this inequality should not stop, for which it is important to generate information and data that serve as a basis for reducing gender disadvantages.

In terms of education, the difference in educational levels by gender has social repercussions, there is a relationship of educational level and pregnancy, due to the fact that it is among the main causes of teenage pregnancy, as well as income and ethnicity (Lechuga et al., 2018), also generally pregnancy is accompanied by school dropout. Regarding labor participation worldwide it is currently 49% for women, for men it is 75%, but in some places the difference is more than 50 percentage points (International Lobour Organization, 2018). In Mexico the figures are similar to global data, 78 out of every 100 men and 44 out of every 100 women participated in economic activities during 2018 (Instituto Nacional de las Mujeres, n.d.). The United Nations (UN, 2015) reports that, worldwide, women earn less than men, in most countries women on average earn between 60 and 75 percent of men's wages. According to the National Survey of Household Income and Expenditures (ENIGH) of the National Institute of Statistics and Geography (INEGI, 2020), there are 64.4 million women in Mexico, representing 51.5% of the total population, 60.6% of women between 3 and 29 years of age attend school and 44 out of every 100 women are affiliated with a health institution. An example of labor inequality is that only 34.7% of people over 25 years of age who work as public, private and social sector officials and managers are women.

On the other hand, the construction of social norms allows the emergence of authority figures that guide towards compliance with rules or sanctions (Betancur and Castro, 2016). Social norms are rules of action shared by people in a given society or groups; they define what is considered normal and acceptable behavior for people. There are also gender norms where gender is conceptualized as a social system that distributes resources, roles, power and rights according to whether a person or practice is perceived as masculine or feminine. They are learned in childhood, in the socialization process and then reinforced in the family and social context: at school, at work, in religion, in the media and other institutions. These norms are produced and reproduced through social interaction, when people conform to or question notions of masculinity and femininity. Most existing gender systems are deeply hierarchical, inequitable, privileging what is masculine over what is feminine, keeping this system intact. This can have multiple consequences such as affecting adolescent health, child marriage, intimate partner and violence (Cislaghi and Heise, 2020). The World Health Organization (WHO, 2016), mentions that the norms, roles and relationships assigned to each gender generate inequalities between men and women.

With respect to gender roles in Mexico, although they have been changing, until today women have been educated mainly for domestic work, unlike men who have been educated to be providers. In addition, women are located to a greater extent in the non-economically active population, performing domestic work that is not economically remunerated. Likewise, the female gender has greater responsibility for the care of infants and elderly people in their

households, and they are also responsible for preparing household food in 85-90% of cases (WHO, 2014), factors that have an impact on environmental vulnerability.

On the other hand, an important term for this study is marginalization, which was used in the methodology and is a multidimensional phenomenon produced by the economic model expressed in inequality of progress and exclusion of social groups, which generates vulnerability. The characteristics of marginalization are illiteracy or incomplete primary education, housing without drainage, without sanitation, housing without electricity, overcrowding and low income (CONAPO, 2010), there are different levels of marginalization according to these characteristics. The marginalization index is measured in AGEB (Basic Geostatistical Area), depending on the socioeconomic characteristics of each territory (CONEVAL, 2010).

In this sense, vulnerability is the absence of capacity of communities to cope with changes or during an emergency, it is determined by exposure to some phenomenon, being fragility and capacity to adapt or respond (Vera and Albarracín, 2017). The term vulnerability refers to the condition of being defenseless for a person, a group or a community, when someone does not have the resources to meet basic needs, such as food, housing, health services and drinking water, so it is closely linked to marginalization, therefore, citizens are at greater risk in any situation (Espinosa et al*.,* 2012). Thus, Zamudio *et al*. (2014) analyzed vulnerability according to gender, turning out to be different, the most important factors for women were violence, families and households, political participation, work, and being a rural or indigenous woman. For men, poverty, childhood and migration were significant. An example regarding gender differences was evidenced in a study on mood and emotions of students conducted in Chile, in which the lowest scores were obtained by women, which may be related to depression and could increase the risk of suicide. The authors conclude that including a gender perspective can contribute to the improvement of educational and health policies (González et al., 2016).

On the other hand, there are currently multiple environmental problems in the world, the most important of which is the climate emergency that increasingly affects the health and well-being of people (WHO, 2018), the mortality rate increases as temperatures deviate from the optimal temperature for the population. Such vulnerability increases with gender, for example, pregnant women are especially vulnerable to malaria, as malaria-transmitting mosquitoes are twice as attractive to them as non-pregnant women (WHO, 2016). An example of environmental vulnerability was what happened in Bangladesh in 1991, when cyclones claimed the lives of 140,000 people, 90% of whom were women (Aguilar, 2004). This is explained by the fact that there are more women than men who are confined to their homes, taking care of children, several of them lose their lives waiting for company to go to a safe place, in addition to the fact that they are generally less well nourished, and consequently have less physical capacity than men to cope with such circumstances. In addition, as a consequence of climate change on women, one can mention the increase in workload, causes insufficient food, increase in family violence, harassment and loss of privacy in shelters, among others (WHO, 2016).

In this regard, it is emphasized that women, especially those living in poverty, are more vulnerable to natural disasters, this is evidenced by a study conducted in 141 countries, which found that girls, boys and women die more than men as a result of natural hazards. If the socioeconomic status of women is high, the number of deaths of women and men is equal during and after natural disasters, but when the socioeconomic status of women is lower, they are more likely to die than men (Neumeyer and Plumper, 2007) men (Neumeyer and Plumper, 2007). Therefore, environmental vulnerability is different in women and men, due to a different social vulnerability in which the social exclusion of women and their lack of access to power increase their fragility and risks. Women were brought up to assume their own self as "being-for-others", which causes a double vulnerability during a disaster. Thus, when there is training

for both genders in a community, it increases their fitness and resilience competence, even after an extreme event (Oswald, 2016). Gender differences in occupation and educational attainment suggest greater social and environmental vulnerability of women (Neumeyer and Plumper, 2007; Jungehülsing, 2010; WHO, 2016; Oswald, 2016).

In view of the above, the hypothesis proposed is that gender has an effect on the level of education and therefore on occupation, having economic, social and personal effects, generating greater social and environmental vulnerability. Therefore, the objective of the study was to analyze gender differences in educational level and occupation and their possible social and environmental vulnerability in the city of Delicias, Chihuahua, Mexico. This generates information that serves as a tool to minimize gender differences and reduce their social and environmental vulnerability, in order to truly achieve gender equity.

Method

Study area

The municipality of Delicias is located in the south-central zone of the state of Chihuahua, in northern Mexico (Figure 1), between parallels 27°57' and 28°17' North Latitude; meridians 105°20' and 105°42' West Longitude (CONAGUA, 2008).

Figure 1
Location of the municipality of Delicias

Source: Matos (2015).

Procedure

For the data collection, a survey was designed to gather general information about the people, such as level of education and occupation. The survey was conducted directly in households in different neighborhoods, with stratified random sampling. Participation was voluntary and the objective of the study was notified, without taking personal data such as name, for personal protection. A survey was used because it is a standardized instrument that allows efficient data collection (Meneses and Rodriguez, 2011).

The minimum sample size was calculated using the formula for a finite population, with a minimum of 95% reliability, a maximum of 5% precision error, to ensure representativeness

of the population. To obtain the sample, the total population of the municipality of Delicias with 148,045 inhabitants was considered (COESPO, 2017), being the most recent figure at the time of the study, resulting in a minimum sample size of 384 people. The formula used was as follows:

$$n = \frac{N \; Z^{2}_{\alpha/2}(pq)}{d^{2}N + Z^{2}_{\alpha/2}(pq)}$$

where n= is the minimum representative sample size; N= is the population size; Z= is the value of the standard normal distribution for a given confidence level; pq= is the variance in the response, using for this study the maximum variance assumption (0.25), where p is the probability of success in the expected response and q the probability of failure (q=1-p) and d=is the maximum precision error of the sample.

For the sampling, the classification of marginalization was considered, which has five levels, the levels of higher marginalization (MA and A) were grouped because they are few AGEB and have little land area, leaving only four levels, MA-A with 3 AGEB, M with 17, B with 21 and MB with 31, giving a total of 72 AGEB representing 100%. Each level was divided by the total number of AGEB (72) and multiplied by 100 to obtain the corresponding percentage. The sample number (384) was divided into these percentages to avoid overestimation, obtaining a representative sample of each marginalization zone. Therefore, the number of surveys per level was MA-A 16, M 91, B 112 and MB 165, for a total of 384, which is represented in the following graph (Table 1).

Table 1

Number of surveys by level of marginalization

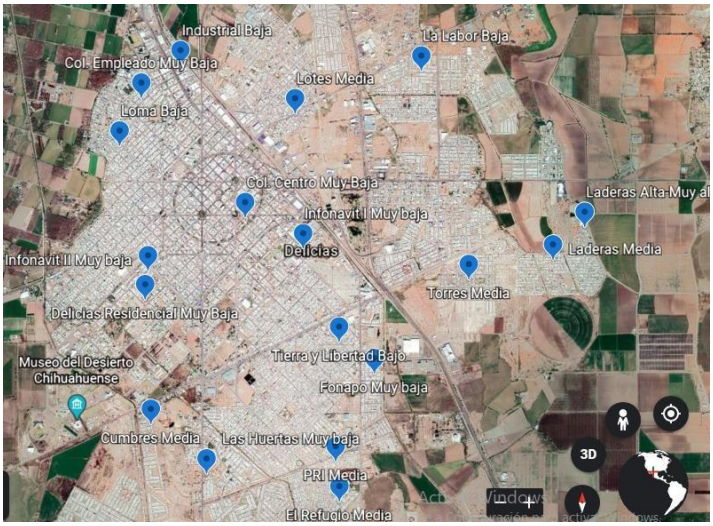
Level of marginalization	Number of AGEB	Number of surveys per level
MA-A	3	16
M	17	91
B	21	112
MB	31	165
Total	72	384

Sampling

A stratified random sampling was carried out, divided by degree of marginalization of the city's AGEBs, according to the CONAPO classification (2012), in order to analyze the information and compare by strata, which are given by an already established classification, the randomization consisted of neighborhoods and households. Data collection was conducted in the summer of 2019. The data were obtained from 17 neighborhoods distributed throughout the city, which were: Zone MA-A of marginalization; Colonia Laderas (farthest sector), Zone M; Laderas (entrance sector), Las Torres, PRI, El Refugio, Los Lotes and Cumbres, from Zone B; Loma de Pérez, Colonia Industrial, La Labor, Tierra y Libertad, from Zone MB; Fovissste I, Fovissste II, Ignacio C. Enríquez, Las Huertas, Colonia del Empleado, Delicias Residencial and Colonia Centro (Figure 2).

Figure 2

Location of neighborhoods surveyed in Ciudad Delicias



Source: *Google Earth (2020).*

Data analysis

Finally, descriptive statistics were used to analyze the results, which were measured based on 100% of the frequency presented in the survey, with the gender of the participants as the main variable. Descriptive statistics allows analyzing a set of data, from which conclusions are obtained (Salazar and Del Castillo, 2018). In such a way that the information derived from the research is synthesized through tables and graphs, providing timely information on the results (Rendón-Mácias et al., 2016).

Results

Age by gender

The participants were between 11 and 90 years of age, the minimum age by gender did not vary, the maximum age did, while the maximum age for men was 85 years, for women it was 90 years, in the average age there was a slight difference of one year, 34.58 years for men and 35.77 years for women.

Occupation

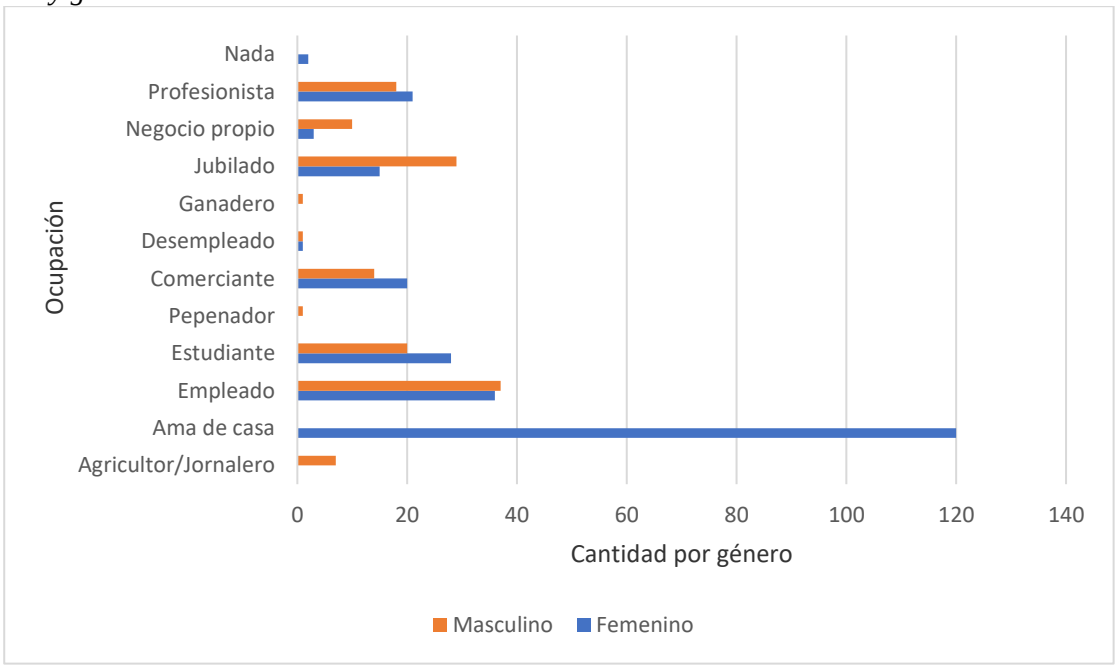
Of the respondents, 139 were male (36.19%) and 245 were female (63.81%). In terms of occupation, of the total respondents 31.25% were housewives, 19% employees, 12.5% students, 11.45% retired, 10.5% professionals, 8.85% merchants, 3.38% people with their own business and only 1.82% people engaged in farming or day laborers (Figure 3).

Source: Own elaboration.

Occupation by gender

Similarly, the occupations in the municipality were analyzed by gender to see if there are differences (Figure 4). Of the total number of women only 38.7% are in the economically active population, below that reported by Kaplan and Piras (2019) based on Inegi data, with a percentage of 43.5 at the national level for 2018. Among women, the main occupation was housewife with 48.97%, in second place, employee with 14.69% and in third place student with 11.42%. In the case of men it was different, in first place, they were employees with 26.61%, in second place, retirees with 20.86% and in third place, students with 14.38%. In contrast, the first place for women is for housewives and for men it is for employees. Therefore, there is a difference in the occupations according to gender, in addition, there was a greater variety of occupations among men, and in some cases they were exclusive to this gender, such as farmers, cattle ranchers and scavengers.

Figure 4
Occupation by gender



Source: *Own elaboration.*

In Mexico, women's labor participation is below men's contribution, and is also low in comparison with other countries, which causes significant economic impacts. Women's labor

participation was only 45% in 2019, compared to 77% for men, with a difference of 32% (UN, 2020). The results reported in the present article can be explained by data obtained by Kaplan and Piras (2019), who state that worldwide, female labor participation is lower than male labor participation. However, compared to other Latin American countries, labor force participation among women in Mexico is extremely low in Mexico is extremely low compared to other Latin American countries. Mexico is the country with the second largest gender gap in Latin America. The participation rate of women of reproductive age in Mexico is particularly low, and a result related to the low labor participation of women is the high percentage of young women with no education. This evidence suggests that low female participation reflects the constraints women face in matching their domestic responsibilities with employment, rather than preference. It also affects the perception of unequal opportunities and open discrimination in the Mexican labor market.

Occupation by marginalization zones

The occupations by gender at each level of marginalization were also analyzed. For women in all marginalization zones being a housewife predominated (Table 2), but with different percentages, having in the highest marginalization zone (60%) and in the lowest marginalization zone (40.9%), decreasing by almost 20 percentage points. Therefore, the lower the level of marginalization, the lower the percentage of housewives.

Table 2

Dominant occupation for females by marginalization zone

Marginalization zone	Occupation	Percentage
A-Very high	Housewife	60
Media	Housewife	53.3
Download	Housewife	57.7
Very low	Housewife	40.9

In the case of men, the dominant occupation varied according to the marginalization zone (Table 3), with day laborer/farmer in the first place in the A-Very high marginalization zone, employee in the Medium and Low zones, and retired in the Very low marginalization zone. There are more employment options as marginalization decreases, in contrast to the most marginalized zone where more than 60% of the occupations are related to farming. In addition, being part of formal jobs (employee/retiree) means having benefits, among other benefits, which reduces their vulnerability, since access to productive employment and decent work is essential to meet people's needs (Weller, 2012).

Table 3

Dominant occupation for the male gender by zone of marginalization

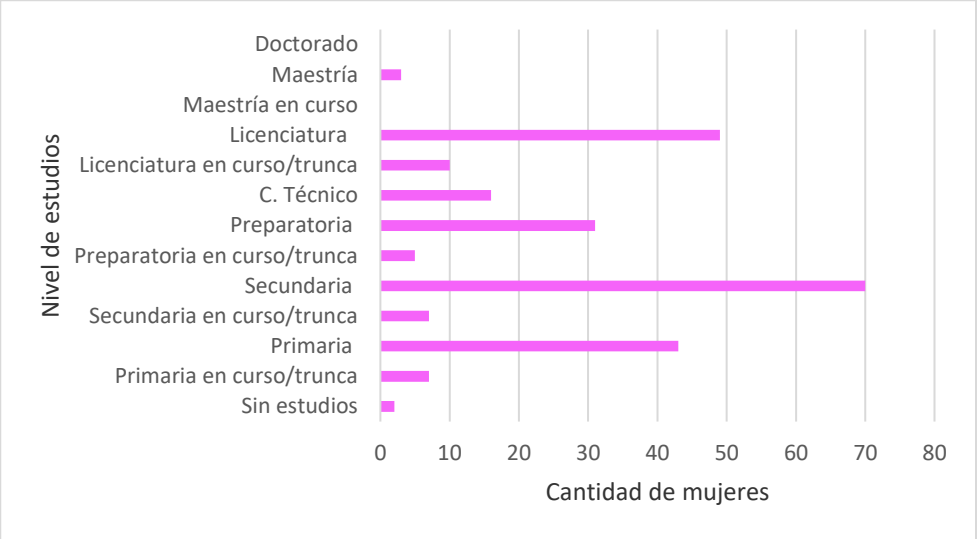
Marginalization zone	Male Occupation	Percentage
A-Very high	Farmer/Journalist	66.6
Media	Employee	35.29
Download	Employee	34.14
Very low	Retired	26.6

Studies

For this classification, there were several levels: no studies, elementary, middle school, high school, bachelor's, master's and doctorate, with two variants: complete or truncated/ongoing. With four uneducated people, two from the MA-A zone, one from the M zone and one from the B zone, only one person with a doctorate in the B zone and predominantly at the high school level for the Municipality. Regarding the level of studies by gender, among women, secondary school completion predominates with 28.57%, followed by bachelor's degree completion with 20%, followed by primary school completion with 17.55% (Figure 5). This has an effect on women's occupations (Kaplan and Piras,2019), representing that career aspirations cannot be high given that more than half (55.51%) of the female gender has less than high school level education.

Figure 5

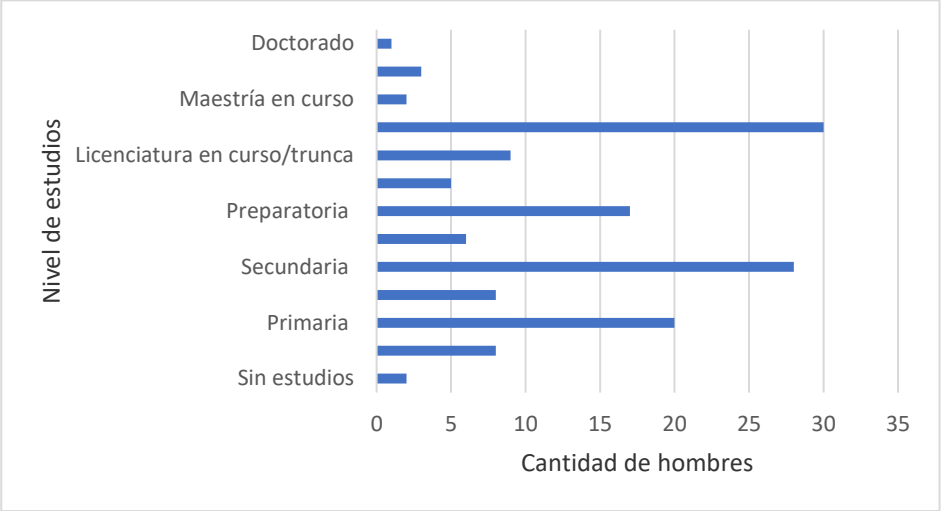
Educational level in women



On the other hand, the level of studies in men was different, with 21.58% of men having completed a bachelor's degree, 20.14% completed secondary school, and 14.38% completed elementary school (Figure 6).

Figure 6

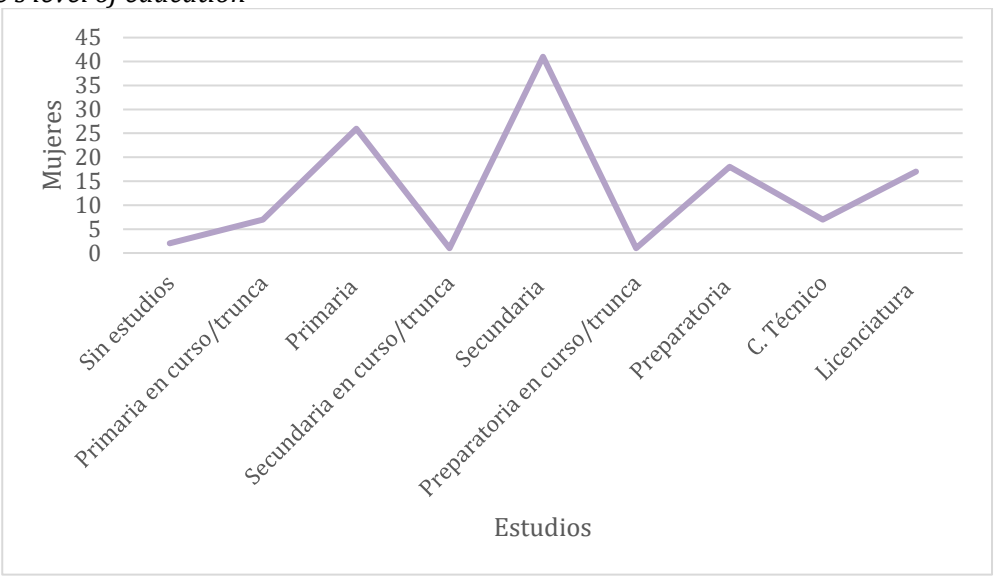
Level of education in men



Contrasting the first place of studies in men and women, for men it is completed bachelor's degree while for women it is completed high school, having a significant difference, this result is related to occupation (Hualde, 2015) since being a housewife predominated. Regarding the educational level of housewives, 34.45% only studied secondary school, 21.84% studied primary school, and only 15.12% completed high school (Figure 7).

Figure 7

Housewife's level of education



Education on a personal level means being able to socialize, acquire learning, develop potential and interact with the environment. At the social level, it translates into culture, social welfare and sustainable development (Lechuga et al., 2018). Having a lower level of education means that women face effects in the labor market, for example, less opportunity to obtain a good job, lower salaries, fewer benefits, less formality, and less possibility of acquiring goods, among others. In the personal sphere, dependence on their partner, depression, higher number of pregnancies, psychological, emotional and economic violence, occurring higher risk of violence in people who do not reach to study a degree (Gonzalez and Mora, 2014). In the social sphere, discrimination, backwardness, vulnerability, among other effects. Likewise, the importance that education suggests for economic growth and for people's income has been the

subject of several research studies increases education increases the productivity of the individual, he/she will have higher income and job opportunities (Gutierrez and Salgado, 2020). As a result of the difference in educational levels by gender there are social repercussions, for example, there is a relationship of educational level and pregnancy (Lechuga et al., 2018). In this way, the educational level has results in labor participation, globally it is currently 49% in women, for men it is 75%, (International Lobour Organization, 2018). Differences in educational level and labor occupation are important because they generate social exclusion, where social exclusion has a gender dimension that increases women's vulnerability (Lechuga et al., 2018). Therefore, gender has an effect on the level of education and, in turn, on occupation, generating economic, social, personal and environmental differences that represent a heightened vulnerability.

Discussion and Conclusions

In the present study, differences in occupation by gender were detected, while for women the first place was housewife, for men the first place was employee. Likewise, there are occupations with gender exclusivity, for example, in household matters (housewives) only women were registered, on the other hand, in the occupations of scavenger, farmer and cattle rancher only men were registered. In addition, the level of marginalization affects the occupation in both genders, in males it was found that when marginalization decreases there is a greater variety of jobs, in contrast to the female gender in which housewife predominated at all levels, however, decreasing its percentage as marginalization decreases, that is to say, it is directly proportional. Of the total number of women, only 38.7% are in the economically active population, a figure that is below the percentage reported at the national level (43.5).

Regarding the level of education by gender, for men a bachelor's degree prevailed, while for women it was secondary school completion, which has an effect on the occupation. Differences in educational level and employment are important because they generate social exclusion. Given gender roles, women have lower educational levels and therefore less job opportunities, lower incomes and less purchasing power, increasing their vulnerability.

The results indicate that there are gender differences in occupation and level of education, thus suggesting greater social and environmental vulnerability of women. As a result, this gender has greater exposure to risks, for example, climate change has different consequences by gender due to the different degree of vulnerability. Therefore, it is important to generate information to be able to implement projects and social programs focused on both raising awareness of the importance of gender equity and minimizing differences in order to reduce vulnerability and its effects.

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