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Women in STEM, Experiences of Mexican Women Scientists

Mujeres en STEM, experiencias de Científicas Mexicanas

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Abstract

From a gender perspective, it is important to recognize that sexual differences are distinguished from social constructions based on these differences and, like stereotypes, are learned and transmitted culturally and where, historically, women have gone from exclusion to segregation in the field of science and their contributions to scientific knowledge. Even today, women still constitute a minority in training and professional itineraries in the scientific-technical field. Therefore, a study was oriented to make visible through a transversal analysis, to understand the different forms of discrimination, harassment and violence against women in the scientific field. For this purpose, a data treatment was carried out, such as the self-perception of discrimination and violence, in a measurable way, as well as the domestic chores, where it was observed the tendency of particular tasks such as the support with the children continues to be a task of greater proportion for women, which gives space to the exercise of motherhood and the labor and social discrimination itself. Finally, there were anonymous testimonies of discrimination and violence, from the voice of women scientists. Thus, while recognizing the work of numerous institutions, civil associations, the creation of instruments and departments in universities on gender issues and women's own self-recognition, we know that the task that remains pending is to address from the initial stage of school, the visualization of girls in science, the elimination of barriers that are socially and culturally present, breaking those gender roles and stereotypes that interfere in their training, so that science is neutral, without sex and/or gender, and on equal terms.

STEM, Science, Women Scientists

Resumen

Desde la perspectiva de género es importante reconocer que las diferencias sexuales se distinguen de las construcciones sociales basadas en estas y, al igual que los estereotipos, son aprendidos y transmitidos culturalmente y donde, históricamente, las mujeres han pasado de la exclusión a la segregación en el ámbito de la ciencia y sus aportaciones al conocimiento científico. Inclusive, hoy en día, las mujeres, todavía constituyen una minoría en itinerarios formativos y profesionales del ámbito científico-técnico. Por ello, se orientó un estudio para visibilizar mediante un análisis transversal, entender las diferentes formas de discriminación acoso y violencia en el ámbito científico hacia las mujeres. Para ello, se realizó un tratamiento de datos como, la autopercepción de discriminación y violencia, de una forma medible, así también, lo referente a las labores domésticas, donde se observó, la tendencia de tareas particulares como que el apoyo con los hijos sigue siendo una tarea de mayor proporción para la mujer, que da cabida con lo referente al ejercicio de la maternidad y la propia discriminación laboral y social. Finalmente, se contó con testimonios anónimos de discriminación y violencia, de la voz de las científicas. Es así, como sin dejar de reconocer, la labor de numerosas instituciones, asociaciones civiles, creación de instrumentos y departamentos en las universidades en materia de género y el propio auto reconocimiento de las mujeres, sabemos que la tarea que queda pendiente es la de abordar desde la etapa inicial de la escuela, la visualización de las niñas en la ciencia, la eliminación de las barreras que social y culturalmente están presentes, romper esos roles y estereotipos de género que interfieren en su formación, para que la ciencia sea neutra, sin sexo y/o género, y en igualdad de condiciones.

STEM, Ciencia, Científicas

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Introduction

In the 1960s, the concept of gender emerged within the field of psychology in its medical stream, to highlight a hitherto unacknowledged fact: there was something outside biological sex that determined identity and behaviour (1). The term gender contains the social definition of reproductive behaviour, which can be separated from the reproductive role per se (2). Gender therefore constitutes the explanatory category of the social and symbolic historical-cultural construction of men and women on the basis of sexual difference (1). What the concept of gender helps us to understand is that many of the things we think of as "natural" attributes of men or women are in fact socially constructed characteristics that are not determined by biology.

From the distinction between biological sex and the socially constructed, the use of gender began to be generalised to name many situations of discrimination against women, justified by the supposedly different anatomy, when in reality they have social origins. From a gender perspective, it is important to recognise that sexual differences are distinguished from social constructions based on them and, like stereotypes, are learned and transmitted culturally.

A gender perspective implies recognising that sexual difference is one thing and that the social attributions, ideas, representations and prescriptions that are constructed on the basis of sexual difference are another. When we speak of a gender perspective, we are referring to a conceptual tool that seeks to show that the differences between women and men are not only due to their biological determination, but also to the cultural differences assigned to human beings. Looking at or analysing a situation from a gender perspective allows us to understand that the lives of women and men can be modified to the extent that they are not "naturally" determined.

This perspective helps to understand more deeply both women's and men's lives and the relationships between them. This approach questions the stereotypes with which we are brought up and opens up the possibility of developing new content for socialisation and relations between human beings (3).

A more equitable and democratic development of society as a whole requires the elimination of discriminatory treatment against any group. In the specific case of women, half of the population, it has become an urgent necessity to take into account the cultural, economic and socio-political conditioning factors that favour female discrimination. These conditioning factors are not caused by biology, but by social ideas and prejudices, which are interwoven into gender (4).

Since Rossi addressed the question of the absence of women in scientific careers in her study Women in science: why so few? in 1965, interest in the relationship between science and gender has been growing. Science is a cumulative, methodical and provisional system of testable knowledge, the product of scientific research and concerning a specific area of objects and phenomena (5). Historically, women have gone from exclusion to segregation in the field of science and their contributions to scientific knowledge were for a long time invisible, forgotten, devalued and, what is worse, even taken away from them. Even today, they still constitute a minority in training and professional itineraries in the scientific-technical field.

According to figures from the United Nations Educational, Scientific and Cultural Organisation, the proportion of women researchers worldwide is substantially lower than that of men, accounting for only 28.8 % of the total number of women researchers worldwide and 45.4 % in Latin America (6). In the field of technology, the World Economic Forum reports that only 26 % of jobs in the technology sector are held by women (7). Analysis of these percentages shows that the field of science and technology is a masculinised sector in which women find it difficult both to enter and to remain in it, and to turn it into a full-time, long-term career. While specific obstacles for women are evident, the impact is far more wide-ranging, for example when trying to reach and stay in leadership positions in academia, business and/or public administration (8).

In Mexico, although the number of women in science and technology has grown year after year, men continue to outnumber them (9), especially at the higher levels of these professions (10).

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Career and professional opportunities for men are also greater than for women (11). This is mainly due to the fact that in Mexico there is currently a significant gender gap in the study of STEM careers (12), which means that there is a smaller proportion of women studying or working in scientific and/or technological careers; it should be noted that in recent years there has been an increase in women's interest in participating in STEM areas (13).

It should be borne in mind that in Mexico, as is probably the case in several countries, women's roles are influenced to a large extent by culture; therefore, access to knowledge and to workplaces where the male sex predominates implies a greater effort to enter the labour market (14). Reducing the gender gap in STEM areas means making a change in the educational system and in the labour market that allows women to overcome social and technological barriers (15). In this regard, gender stereotypes at school age are one of the challenges encountered in getting more girls and young women to study a career in STEM, as they are transmitted in the family, at school and in the community at large, allowing them to remain, influencing scientific vocations and thus career choices (16).

The Freie Universität Berlin (17), proposes that the category of gender should be understood based on sexual difference, eliminating stereotypes or labels in which it was thought that this differentiation was biological, which led to the separation of women in certain areas because it was believed that they were incapable of performing optimally in various spheres, for example in the field of science, technology, engineering or mathematics and they were sent to other disciplinary fields, such as nursing, teaching, social work, among others.

The phenomenon of women in science becomes complex when other factors or roles are included. An example of this is when the scientist must choose between having or caring for children and continuing with a professional career, modifying her dress to avoid comments from her work colleagues, and sometimes feeling undervalued for her professional competence in research (18). It is clear that Mexican women scientists coexist with the machismo often present in academic practices, while trying to achieve recognition built on equity (19).

For this reason, in this chapter we intend to make visible, through a transversal analysis, the different forms of discrimination, harassment and violence against women in the scientific sphere.

Methodology

Methodological description

A cross-sectional study was carried out, with a target group of women who reported having scientific activity: work, as postgraduate or second degree students, post-doctoral stays and originating from Mexico.

Data collection

In order to construct a scale of violence and discrimination in Mexican women scientists, an extensive literature review was carried out, with the aim of understanding the different forms of discrimination, harassment and violence as relevant social problems in the performance of women in the scientific field.

The first step in the construction of the questionnaire was to use the brainstorming technique, from which the first items emerged. The second step was to use the nominal group technique, according to the evaluative judgement of 12 inter-judge participants. This technique allows the selection of the most highly rated items.

Finally, the scale was constructed, the items that make up the questionnaire are a total of 132, with which a first exploratory study was carried out. The items are separated into 5 groups:

- 17 items on general information, area in which he/she works and academic-work situation.
- 15 items on household chores.
- 6 items on the exercise of motherhood.
- 8 items on socio-economic indicators.
- 86 items on self-perception of harassment, violence, discrimination and tolerance.

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The responses to the items assess the absence or presence of the behaviours through five Likert response alternatives from 0 to 5 (0= Not at all/Never, 1=Very little/Frequently, 2= A little/Sometimes 3= Moderate/Many times 4= A lot/Almost always 5 Excessive/Always), some dichotomous, others multiple choice, closed; and, some more, open (with the aim of clarifying some situations or experiences). The instrument was applied digitally. An open invitation was made in February 2022, through social networks, establishing as inclusion criteria to be a Mexican woman with scientific activity.

Results

The sample consisted of 44 people who responded to the questionnaire. Of these responses, only one was excluded because the questionnaire was incomplete, leaving an n=43.

Socio-demographic data

Of the total number of participants, 95.3% identified as female and 4.7% belonged to the LGBTTTI+ community. Likewise, the participants' ages ranged from 25 to 63 years, with a mean age of 35.6 years. Regarding place of residence, 93% of the participants currently reside in Mexico, while 7% reside abroad. Finally, with regard to marital status, the majority reported being single (44.19%), 39.53% married, 9.30% in a common-law relationship, 4.65% divorced and 2.33% separated.

Employment data

Regarding the occupation of the respondents, 30.23% are studying a postgraduate degree, 25.58% are engaged in teaching-research and 23.26% are engaged only in research activities. In addition, 6.98% stated that they are completely dedicated to teaching, while the rest (39.53%) carry out combined activities of teaching, research and/or academic or post-doctoral stay.

On the other hand, 67.44% stated that they were engaged in paid activities, while 32.56% stated that they had no employment relationship at the time of the interview. Of those women who are currently working, 30.2% work under a contract for class hours, 20.9% work for 40 hours/week/month and have obtained a permanent job.

Only 2.3% are permanent in positions of more than 40 hours/week/month; while the rest (46.6%) have part-time contracts (part-time, more than 20 hours, but less than 40), with or without permanent status.

Academic data

Although the questionnaire had a specific question about the area in which they worked (taking as a reference the areas recognised by CONACYT), the results showed that most of the interviewees declared that they worked in more than one area of knowledge, as shown in Table 1.

knowledge areas	Percent
Biology and Chemistry.	25.6
Medicine and Health Sciences.	14
Engineering.	9.3
Physics, Mathematics and Earth Sciences.	9.3
Humanities and Behavioral Sciences.	7
Social Sciences.	7
Biology and Chemistry, Medicine and Health Sciences.	4.7
Biotechnology and Agricultural Sciences.	4.7
Biology and Chemistry, Biotechnology and Agricultural Sciences.	2.3
Biology and Chemistry, Engineering.	2.3
Multidisciplinary.	4.7
Physical Mathematics and Earth Sciences, Biology and Chemistry.	2.3
Physics Mathematics and Earth Sciences, Biotechnology and Agricultural Sciences.	2.3
Physical Mathematics and Earth Sciences, Engineering.	2.3
Humanities and Behavioral Sciences, Social Sciences.	2.3

Table 1 Distribution of interviewees, by area/s of knowledge

Finally, regarding the recognition and benefits to which the interviewees have access, only 16.27% have the recognition as Desirable Profile (PRODEP), 20.93% are members of the National System of Researchers, 9.30% had access the previous year to Performance Stimulus for Teaching Staff; and only 4.6% participated in the call for Extraordinary Stimuli. Likewise, 27.9% reported having obtained a grant (25.58% from CONACYT for postgraduate studies (SNP), and 2.32% a grant for a research stay (Mexican Council of Science and Technology, COMECYT).

Domestic work

The following results show how the distribution of household chores is carried out, divided into two sections, married or in union and single, separated or divorced women, in order to give a greater context to the data.

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The activities taken into account were six, focused on determining the main items in terms of a contribution to unpaid economic value in households, which are considered by INEGI (Unpaid Work in Households (inegi.org.mx)), Care and support, activities of providing food and activities of maintenance and cleaning of the dwelling.

Married or cohabiting women

Specifically for married or cohabiting women, it was observed that participation is divided according to the type of work, that in terms of food preparation and support with children, women are mainly in charge, while the payment of services to the partner.

Activity	Responsible				
	My husband / wife	Other family member*	Me	Me and my husband / wife	Me + Other family member*
Food preparation	9.5	4.8	47.6	33.3	4.8
Washing dishes	23.8	4.8	28.6	33.3	9.6
Laundry	23.8	4.8	28.6	33.3	9.6
Household cleaning	4.8	0	23.8	42.9	4.8
Supporting children with school work	14.3	0	33.3	19	0
Bathing children	4.8	0	28.6	19	0
Pet care	9.5	0	33.3	23.8	19.2
Paying utilities	47.6	0	33.3	19	0

Table 2 Percentage of respondents declaring their participation, individually or shared with other family members, in household chores. Data are presented as frequencies. *Other family members=parents, siblings, in-laws, brothers and sisters in law

Single, separated or divorced women

The following table shows that the women who are single, separated or divorced are in charge of all the items considered in the analysis, as indicated in table 3.

Activity	Responsible				
	My husband / wife	Other family member*	Me	Me and my husband / wife	Me + Other family member*
Food preparation	0	9.1	77.3	0	13.6
Washing dishes	0	4.5	68.2	4.5	18.1
Laundry	4.5	9.1	77.3	0	4.5
Household cleaning	0	9.1	63.6	0	18.1
Supporting children with school work	4.5	4.5	36.4	0	0
Bathing children	4.5	9	31.8	0	0
Pet care	0	4.5	68.2	0	4.5
Paying utilities	4.5	9.1	68.2	4.5	4.5

Table 3 Percentage of respondents declaring their participation, individually or shared with other family members, in household chores. Data are presented as frequencies**.** *Other family members=parents, siblings, in-laws, brothers and sisters-in-law, brothers and sisters-in-law, sisters and brothers and sisters-in-law.

Exercise of motherhood

The results showed that 51.16% have no children, while 48.83% have children (13.95% reported having two children and 34.88% reported having only one child). During

During the gestation period, only 9% had access to paid medical leave, while 32.6% were forced to resign from their jobs or take leave of less than 45 days as stipulated by law.

After the birth of their children, 6.97% of the interviewed women held full responsibility for the care of the baby, while the rest (93.03%) declared to have shared the responsibility with their partner, with other family members or to have hired people and/or services for the care of the child.

With regard to household chores, only 4.65% of women with children reported maintaining their level of responsibility for these tasks after the birth of their children, while the rest (95.35%) reported an increase in the participation of their partner, other family members or hired persons and services for these duties.

Economic dependency

46.51% of the women depend exclusively on their income, while the rest (53.49%) share expenses with their partner and/or other family members.

Self-perception of violence and discrimination

When respondents were asked about their knowledge of the bodies or institutions in charge of monitoring and addressing situations of violence and discrimination, 41.86% stated that they did not know of any such bodies.

When asked about some acts of violence, the perception of a high level of violence (3= Moderate, 4= A lot or 5= Excessive) stands out for most or all of the interviewees (Table 4).

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Action	Level 3	Level 4	Level 5
Undue physical approach	18.6	11.6	55.8
Deliberate physical contact	7	16.3	67.4
Intentional touching	9.3	14	72.1
Receiving obscene comments	23.3	23.3	51.2
Receiving sexual comments	16.3	23.3	60.5
Unwanted looks at the body	20.9	23.3	44.2
Masturbating in public places	0	16.3	81.4
Showing genitals	0	11.6	86
Hitting	0	0	95.3
Verbal aggression	7	16.3	69.8
Invasion of pregnant/elderly/disabled spaces.	20.9	20.90%	44.2
Obscene gestures	16.3	23.3	51.2

Table 4 Perception of the level of violence in different acts. Data are presented as frequencies

Respondents were also presented with a list of violent or aggressive acts and asked if these had been perpetrated against them. Table 3 shows the percentage of women who stated that they had been victims of such aggression at least once in the last year.

Aggression received	Occurred at least once within the last year
Undue physical approach (distance of less than 10 cm torso to torso).	37.21
Harassment, defamation or persecution on social networks	27.91
Violation of privacy on social networks (publication without permission of photos, videos or private information)	6.98
Receiving intentional touching on private parts (genitals, mouth, waist, legs)	20.93
Receiving obscene comments	51.16
Having obscene gestures or signs made to you	46.51
Being subjected to leering (insistent, suggestive or insulting looks at various parts of the body)	62.79
Seeing/Feeling/Hearing someone masturbate in public places	11.63
Having someone show you their genitals	6.98
Being intentionally hit	4.65
Being verbally assaulted (insults, shouting)	44.19
Being threatened or intimidated	37.21
Being manipulated	46.51
Being humiliated or discredited	55.81
Being isolated or prohibited from visiting or contacting certain people	20.93
Being forced to provide personal information about calls, messages, contacts and other activities you do on your cell phone	9.3
Being restricted from using/spending/ investing your own money or wealth	23.26
Being forced to provide your financial information (income, expenses, assets, wealth) to your partner, family members or friends	6.98
You have been forced to perform household chores under unequal conditions with respect to other family members	39.53
Invaded spaces for the exclusive use of certain community/s to which you belong (seats for pregnant women or the elderly, bathrooms, smoke-free places, etc.).	34.88

Table 5 Violent or aggressive acts of which the participants have been victims. The data are presented as frequencies

They were also asked about specific discriminatory acts. They reported having been discriminated against at least once in the last year, according to the following percentage distribution in Table 4.

Discriminatory act	Occurred at least once within the last year
Being discriminated against on the basis of gender (for being a woman or for being from the LGBTTI+ community).	51.16
Being discriminated against for having a disability	9.3
Being discriminated against for having a disease or special health condition (physical or mental)	16.28
Being discriminated against because of your skin color	23.26
Being discriminated against because of your dress	34.88
Being discriminated against for having tattoos, piercings or piercings	6.98
Being discriminated against because of any other physical characteristic (facial features, hair color, height, complexion, etc.)	30.23
Being discriminated against because of your trade or occupation	9.3
Being discriminated against because of your religious beliefs	9.3
Being discriminated against on the basis of political or social ideology	20.93
Being discriminated against because of your age (for being very young or for being an older adult)	30.23
Being discriminated against, excluded or made invisible in the discourse of other people (teachers, colleagues, civil servants, officials, elected officials)	62.79

Table 6 Discriminatory acts of which the participants have been victims. Data are presented as frequencies

Conclusions

Among the data to be highlighted in the research, it stands out that the occupation of the respondents is studying a postgraduate degree or are engaged in teaching-research or research. This gave us a good basis for the specific and potential observations that can be made in this study.

Regarding the participation of married women in domestic chores, it was found that there is a separation of tasks between the couple and her, however, most of them state that their participation in the preparation of food, supporting the children with academic tasks and bathing the children is still greater. The percentages change drastically with single, separated or divorced women, where all domestic activities are theirs.

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With regard to the exercise of maternity, it is worth noting that, during the pregnancy period, 32.6% were forced to resign from their jobs or take leave of less than 45 days as stipulated by law, and after the birth of their children, the majority received support, either by sharing responsibility with their partner or with other family members, or even by hiring staff. Similarly with household chores after the birth of their children.

On the other hand, when asked about their knowledge of the bodies or institutions in charge of monitoring and dealing with situations of violence and discrimination, 41.86% stated that they did not know of any such body. It is worth noting that all of them showed that they were involved in or participated in violent acts, highlighting the perception of a high level of violence, ranging from moderate to excessive, including women who stated that they had been victims of these aggressions at least once in the last year.

Among them, being the object of leering at the body, being humiliated or discredited, having exclusive use spaces invaded and being verbally assaulted (insults, shouting), among many others, addressed and detailed in the study. Likewise, regarding specific discriminatory acts, they indicated having been discriminated against, excluded or made invisible at least once in the last year.

The above gives us a sample of what has been made visible and the points to focus on in terms of equity and the creation of programmes and education on the gender perspective, now more than ever, when the participation of Mexican women in science is affected by a phenomenon known as the scissors or pyramid effect (20), in which the number of women is lower as they advance in their professional careers in the scientific field; This phenomenon is also observed in other fields, e.g. the number of female managers in companies is lower than the number of male managers (21).

On the other hand, the trickle-down effect refers to the fact that women are disappearing through the cracks in the system, to the point of disappearing in some areas, which gives continuity to the metaphor of the glass ceiling and glass walls, which is used to explain the difficulties faced by women in different areas (22).

The glass ceiling, according to the above, is the difficulty women face in gaining access to decent working conditions that keep them away from precariousness, informality and poverty; glass walls are those that keep them away from the spaces of change, glass ceilings are the difficulty to occupy and remain in management and decision-making positions; being invisible, transparent, and made of glass, they are not visible, they are fragile, and are the tip of the iceberg of the oversaturation of work, care of the home and family (23).

The role played by various institutions in recognising the activity of Mexican women in science is important. To mention a few, the Group for Women in Science (GPMC) was one of the first to take an interest and create the first programme to promote the participation of women scientists); As a result of these movements, women from other areas of knowledge have joined in, which is why it was necessary to form the Mexican Association of Women in Science (AMMEC) with the aim of encouraging participation in science and promoting the professional development of the country's women scientists.

The task that remains to be done is to address the visualisation of girls in science from the initial stages of school, to eliminate the barriers that are socially and culturally present, to break down the gender roles and stereotypes that interfere in their training, so that science is neutral, without sex and/or gender, and on equal terms.

Testimonies

Finally, participants had a space where they were free to add comments and experiences of violence, harassment and discrimination, based on the question: In the last year have you been a victim of violence/harassment/discrimination? Describe the situation(s). Responses will be displayed below, while maintaining anonymity.

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Violence and harassment
A fellow teacher makes inappropriate comments to me and even forced me into unwanted contact.
A man in the area where I am who has a higher level than me invited me to go out and to pass by me, but he was so insistent that he made me feel uncomfortable, how I did not accept the invitation he began to have acts of sabotage against me.
A co-worker follows me, takes pictures and videos of me, I went to my boss and he never did anything.
Working conditions have been taken away from me, I have been intimidated with taking complaints to higher instances and have been excluded from work activities proper to my category
Patients and colleagues who think it is okay to make comments about how pretty my body is or suggest how I should dress to look better, more feminine
Unwanted stares, obscene and sexual comments, comments that minimize personal feelings and professional knowledge.... Impersonating my identity on networks
I was diagnosed with depression and burnout, when I went to my thesis director to explain the situation and that it was affecting me, he dismissed all of that and reduced it to, the only thing you should worry about is what you will do once the fellowship is over. He has constantly made me feel less academically by displacing me or not considering me.
Gaslighting on a daily basis where I gave my social service and sexual harassment at the last place I work.
At my job I was harassed until I quit because of a mistake made in the past because of a disabling condition due to a depressive illness
In the lab...an acquaintance took pictures of my legs and showed them to everyone, including my thesis advisor...he got a laugh out of it too
My thesis advisor asked me things about my body when I told him I was pregnant...very uncomfortable questions
I have had to do chores (cleaning, tidying up) unequally with other team members, just because I am a woman
In my lab one of my classmates, playing, forcibly kissed me, I reported it and my tutor told me that he would have done the same...now nobody talks to me or takes me into account for articles. I tried to write on my own and asked for support in a facebook group exclusively for Mexican women scientists... the next day my tutor spoke to me to threaten me saying that he was going to get me into legal, academic and ethical problems if I tried to write on my own... to date I have no article.
I sought psychological help for my son with ADHD, the psychologist I found, told me that he was going to make me a dynamic to help me get out all the anger against my son, he ended up touching me.
In the laboratory where I was doing my master's degree I suffered harassment by a colleague and when I commented it, no one in the institution helped me.
Several years ago, a former co-worker (industry) harassed a colleague and me, he made lewd comments, touched us in an unwanted way, he made inappropriate approaches to my colleague several times.
In my job... deliberate physical contact, unwanted looks at the body, receiving sexual comments.

Discrimination
I finished my PhD fellowship... I requested support from my tutors for being SNI3, but I was not a candidate... I was told to tell my parents to support me or to get a husband so he can do it.
Because I am a woman they don't call me to be PI, they call the doctor I share a practice with. They call me Miss, even when they look for me for a consultation and on some occasions I have lost patients because the husband prefers his wife to be treated by a man.
Because I am a woman, I have been deprived of many opportunities to join certain commissions.
I have not been taken into account or taken seriously because I am a woman.
Where I work, I am not allowed to do some activities because I am a woman... I am not allowed to collaborate on articles in my lab
I was discriminated against in a competitive examination because I am a woman, because of my age and my hierarchical level.
I filed a complaint for discrimination... Because of the complaint I filed, my other coworkers stopped talking to me and they talk about me all the time. When I decided to become a mother I was denied rights such as the student exchange, arguing that it was because I decided to become a mother."
I have been treated unequally by coworkers, who believe that because I am a woman they can treat me as if I were their slave
I had a nervous breakdown due to a hormonal imbalance... I told my boss about it and he told me that we were already in bad shape.
I went through a nervous breakdown due to a hormonal imbalance... I told my boss and he told me that we were already in bad shape.
They make me feel different for being a woman in the lab...isolate you from work and leave you without conditions comparable to the rest.
I always have to subtly say that I am doing my PhD and the treatment changes completely.
I have learned that in the work environment preference is not by merit but by compadrazgo and if you are a man, the better.
There was a situation where I was studying Dutch, a pofessor always scolded me and corrected my pronunciation and in the end he ended up telling me that as a woman I have to try harder because I am intellectually inferior.

Table 7

Conclusions

Among the data to be highlighted in the research, it stands out that the occupation of the respondents is studying a postgraduate degree or are engaged in teaching-research or research. This gave us a good basis for the specific and potential observations that can be made in this study.

ISSN-On line: 2539-1372

Regarding the participation of married women in domestic chores, it was found that there is a separation of tasks between the couple and her, however, most of them state that their participation in the preparation of food, supporting the children with academic tasks and bathing the children is still greater. The percentages change drastically with single, separated or divorced women, where all domestic activities are theirs.

With regard to the exercise of maternity, it is worth noting that, during the pregnancy period, 32.6% were forced to resign from their jobs or take leave of less than 45 days as stipulated by law, and after the birth of their children, the majority received support, either by sharing responsibility with their partner or with other family members, or even by hiring staff. Similarly with household chores after the birth of their children.

On the other hand, when asked about their knowledge of the bodies or institutions in charge of monitoring and dealing with situations of violence and discrimination, 41.86% stated that they did not know of any such body.

It is worth noting that all of them showed that they were involved in or participated in violent acts, highlighting the perception of a high level of violence, ranging from moderate to excessive, including women who stated that they had been victims of these aggressions at least once in the last year. Among them, being the object of leering at the body, being humiliated or discredited, having exclusive use spaces invaded and being verbally assaulted (insults, shouting), among many others, addressed and detailed in the study.

Likewise, regarding specific discriminatory acts, they indicated having been discriminated against, excluded or made invisible at least once in the last year. The above gives us a sample of what has been made visible and the points to focus on in terms of equity and the creation of programmes and education on the gender perspective, now more than ever, when the participation of Mexican women in science is affected by a phenomenon known as the scissors or pyramid effect (20), in which the number of women is lower as they advance in their professional careers in the scientific field;

This phenomenon is also observed in other fields, e.g. the number of female managers in companies is lower than the number of male managers (21). On the other hand, the trickle-down effect refers to the fact that women are disappearing through the cracks in the system, to the point of disappearing in some areas, which gives continuity to the metaphor of the glass ceiling and glass walls, which is used to explain the difficulties faced by women in different areas (22).

The glass ceiling, according to the above, is the difficulty women face in gaining access to decent working conditions that keep them away from precariousness, informality and poverty; glass walls are those that keep them away from the spaces of change, glass ceilings are the difficulty to occupy and remain in management and decision-making positions; being invisible, transparent, and made of glass, they are not visible, they are fragile, and are the tip of the iceberg of the oversaturation of work, care of the home and family (23).

The role played by various institutions in recognising the activity of Mexican women in science is important. To mention just a few, the Group for Women in Science (GPMC) was one of the first to take an interest and create the first programme to promote the participation of women scientists; Later, the Grupo de Mujeres en la Ciencia del área Fisiológica (GMCF) was set up; from these movements, women from other areas of knowledge joined, which is why it was necessary to create the Asociación Mexicana de Mujeres en la Ciencia (AMMEC) with the aim of promoting participation in science and promoting the professional development of the country's women scientists.

The task that remains to be done is to address the visualisation of girls in science from the initial stages of school, to eliminate the barriers that are socially and culturally present, to break down the gender roles and stereotypes that interfere in their training, so that science is neutral, without sex and/or gender, and on equal terms.

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