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Artículos Científicos

Experiencias y retos de las mujeres pertenecientes al Sistema Nacional de Investigadores

Experiences and Challenges of Women Belonging to the Mexican National Researchers System

Experiências e desafios das mulheres pertencentes ao Sistema Nacional de Pesquisadores

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Resumen

La necesidad de acceso de las mujeres a la educación superior en México se hace patente desde tiempos remotos. Sin embargo, los primeros estudios sobre mujeres investigadoras en este país pueden rastrearse hace menos de 80 años; más reciente aún es el interés por conocer las vicisitudes por las que pasa una mujer en su carrera como investigadora, y en el contexto mexicano más concretamente como miembro del Sistema Nacional de Investigadores (SNI). Por ello, el estudio que aquí se presenta buscó comprender las experiencias e identificar los retos percibidos por las investigadoras pertenecientes al SNI para el ingreso, permanencia y promoción dentro del sistema.

Esta investigación se enmarcó en el paradigma interpretativo y para la recopilación de la información se utilizó la técnica de la entrevista semiestructurada. El análisis de la información se realizó mediante el método de las comparaciones constantes. A partir este se identificó que las participantes percibieron algunos retos a nivel personal e institucional, los cuales se reflejaron en las metacategorías construidas. La metacategoría de lo personal se dividió en dos categorías. Por un lado, el "ser investigadora", en donde se hace referencia a las experiencias que han vivido y que las han llevado a convertirse en investigadoras, además del significado que tiene para ellas dedicarse a esto y cómo se definen a sí mismas dentro de esta labor. Por otro lado, el papel de la familia, en la que se encontraron en un extremo las dificultades para lograr el balance entre la vida familiar y el trabajo, y en el otro la importancia del apoyo familiar en su carrera profesional. En la metacategoría de lo institucional, mientras tanto, las investigadoras se enfrentan a la cultura y políticas de dos instituciones diferentes: la universidad a la que están adscritas y el propio SNI. Dentro de los hallazgos más relevantes se puede decir que tanto en universidades públicas como privadas las mujeres se enfrentan al desafío de lograr un balance entre la vida familiar y el trabajo. Pasando al actuar profesional, se presentan dos retos comunes: las dificultades para la producción científica y la formación de nuevos investigadores. En las universidades públicas esto se debe en la mayoría de los casos a la falta de tiempo como consecuencia de actividades como la maternidad y la atención a la familia, mientras que, en las particulares, lo primero es consecuencia de los tiempos para la revisión, publicación e indexación, y lo segundo por la ausencia de posgrados orientados a la investigación en la universidad de adscripción.

Palabras clave: condiciones institucionales de la investigación, mujeres investigadoras, políticas de la investigación.

Abstract

The urge of granting women access to education has been present ever science remote times. Nevertheless, the first publications about women researchers in Mexico can only be tracked back 80 years. The most recent interest has focused on the vicissitudes a woman faces in her career as a researcher, more specifically as a member of the National Researchers System (SNI). Thus, in the present study, it was intended to comprehend the experiences and identify the challenges these researchers face in order to become members of the system, keep their permanence and get promoted.

This is a qualitative research based upon the interpretative paradigm. Semi-structured interviews were used to collect the information and it was analyzed through the comparison method. It was found out that the participants perceived challenges at a personal and at an institutional level. Both levels served as metacategories. The personal challenges one was divided into two categories. The first one being "becoming a researcher", which refers to the hardships they faced in order to achieve the status and the significance it has for them. The second one centers in the role family has in their life, the difficulties they´ve encountered to balance it with their work, and the support they had to overcome these. In the metacategory of the institutional, meanwhile, the researchers had to face cultural and political differences of two different institutions: their university and the National Researchers System. The main findings were that women face challenges in balancing personal life and work and the importance the family has in balancing it out in both public and private institutions. With regards of the professional development, there are two common challenges: difficulty to produce new researches and the education of new researchers. In public universities, the reason is the lack of time due to maternity leaves and attention to their family in general, whilst at the private institutions there is a lack of time to revise and publish new papers and the fact that there are no postgraduate programs that are oriented towards research.

Keywords: research conditions, women researchers, research policies.

Resumo

A necessidade de acesso das mulheres ao ensino superior no México tem sido evidente desde os tempos antigos. No entanto, os primeiros estudos sobre pesquisadores do sexo feminino neste país podem ser rastreados há menos de 80 anos; Mais recente é o interesse em conhecer as vicissitudes que uma mulher atravessa em sua carreira como pesquisadora, e no contexto mexicano, mais especificamente, como membro do Sistema Nacional de Pesquisadores (SNI). Portanto, o estudo aqui apresentado buscou compreender as experiências e identificar os desafios percebidos pelos pesquisadores pertencentes ao SNI para admissão, permanência e promoção dentro do sistema.

Esta investigação foi enquadrada no paradigma interpretativo e para a coleta de informações utilizou-se a técnica da entrevista semiestruturada. A análise das informações foi realizada utilizando o método de comparações constantes. A partir disso, identificou-se que os participantes percebiam alguns desafios em nível pessoal e institucional, refletidos nas metacategorias construídas. A metacategoria do pessoal foi dividida em duas categorias. De um lado, o "ser pesquisador", onde é feita referência às experiências que viveram e que as levaram a se tornar pesquisadores, além do significado que tem para elas se dedicarem a isso e como se definem dentro de si. este trabalho. Por outro lado, o papel da família, no qual as dificuldades foram encontradas para alcançar um equilíbrio entre a vida familiar e o trabalho, e, de outro, a importância do apoio familiar em sua carreira profissional. Na metacategoria institucional, entretanto, os pesquisadores enfrentam a cultura e as políticas de duas instituições diferentes: a universidade à qual estão ligadas e o próprio SNI. Entre as conclusões mais relevantes, pode-se dizer que tanto nas universidades públicas quanto nas privadas, as mulheres enfrentam o desafio de alcançar um equilíbrio entre a vida familiar e o trabalho. Passando a atuar profissionalmente, há dois desafios comuns: as dificuldades para a produção científica e a formação de novos pesquisadores. Nas universidades públicas isso é devido, na maioria dos casos, à falta de tempo como resultado de atividades como maternidade e cuidado familiar, enquanto no caso de indivíduos privados, o primeiro é uma

conseqüência dos tempos de revisão, publicação e indexação, e o segundo, pela ausência de cursos de pós-graduação voltados à pesquisa na universidade de atribuição.

Palavras-chave: condições institucionais de pesquisa, mulheres pesquisadoras, políticas de pesquisa.

Fecha Recepción: Noviembre 2018 **Fecha Aceptación:** Mayo 2019

Introduction

The need for women's access to higher education in Mexico has been evident since ancient times. Although between the sixteenth and nineteenth centuries only Micaela Hernández is mentioned as a scientist and professor of physics at the School of Arts and Crafts for Women in the capital of the country (González, 2006), the controversy of the professional education of women begins at least from the management of the Ministry of Public Instruction and Fine Arts in the government of Sebastián Lerdo de Tejada (1872-1876).

The above with the application for admission to the university and professional reception of Matilde Montoya, the first woman who graduated from the National School of Medicine in 1887, without ignoring that already in 1886 Margarita Chorné y Salazar had obtained the title of a independent profession (dentist), also in the National School of Medicine (Díaz de Kuri, 2009).

In the conjuncture of the Mexican Revolution, the National University, the School of Higher Studies is inaugurated and the first cycle of conferences organized by the Ateneo de la Juventud is celebrated, which broadens the professional education opportunities of women (Cano, 2010). In 1912 the First Mexican Scientific Congress was held, where female attendance was significant (Piñera, 2002).

In the late nineteenth and early twentieth centuries, the ideas that questioned the participation of women in science (Cano, 2010) were overcome thanks to women like Aline Schunemann, emeritus researcher at the National Autonomous University of Mexico (UNAM), fourth a woman who holds a degree in Veterinary Medicine and Zootechnics, with 70 years dedicated to research and 94 years old, who affirms "science is not a matter of gender, it is a matter

of working well, if one does things well , one wins his place regardless of whether he is male or female" (Sánchez, 15 de enero de 2015, párr. 21).

This is how the first studies on women researchers in Mexico can be traced less than 80 years ago. In the 40s of the twentieth century, work was done around the first women who were awarded degrees in Physics and Mathematics at the Faculty of Sciences of the UNAM and those who joined the Mexican Mathematical Society. In addition to rescue anthologies of university women, who narrate a biographical synthesis of seven Mexican scientists (González, 2006).

However, it is more recent interest to know the vicissitudes that a woman goes through in her career as a researcher. In this sense, the work of Muñiz and Ramos (2019) is found, which shows the pressure that women researchers often suffer in relation to motherhood. In addition to the study conducted by Castillo (2018), which aims to "show the visible differences, as well as unveil the invisible differences present in the activities related to research, science and technology (...) of the research professors of the National University of San Agustín de Arequipa [Peru] "(p.79). In this it is evident that the contributions of women have less value than that of men.

Regarding specific research on women belonging to the National System of Researchers (SNI), Ruiz (2012) affirms the need to generate policies with a gender perspective within the system, "since both the permanence and the promotion of Mexican women scientists is complicated "(page 48). In addition to the above, there is also the initiative carried out in 2014 at the Benemérita Autonomous University of Puebla (BUAP), which convened the First Congress of Researchers SNI and whose reflections, conclusions and proposals were reflected in the text coordinated by Angélica Mendieta in 2015. More recently, there is the work of Ranero (2018), which reviews the differentiated integration of academics in the SNI, as well as the labor segmentation that characterizes the Mexican academy.

Special mention requires the research carried out by Macías and Islas (2018), who rescue and position information and communication technologies (ICT) as means of empowering women researchers belonging to the SIN.

This is how, although research has been published on the academic profession and specifically on women researchers (Grediaga, 2001, Galaz, Gil, Padilla, Seville, Arcos and Martinez, 2012, Castañeda and Ordorika, (2015), Ordorika, 2015), few references have been found of those belonging to the SNI ascribed to private higher education institutions.

For all the aforementioned, the study presented here seeks to understand the experiences and identify the challenges perceived by the researchers belonging to the SNI for admission, permanence and promotion within the system.

Framework

The SNI is a group in which the scientific disciplines practiced in the country are represented and cover a great majority of higher education institutions and institutes and research centers operating in Mexico. It was created by presidential decree on July 26, 1984, to recognize through the appointment of a national researcher and its respective economic stimulus the work of those researchers dedicated to produce scientific and technological knowledge.

The main objective of the SNI is to promote and strengthen, through peer evaluation, the quality of scientific and technological research and innovation that takes place in the country. It also aims to contribute to the formation and consolidation of researchers with scientific and technological knowledge at the highest level (Official Gazette of the Federation [DOF], 2018).

The disciplines of affiliation are organized by areas of knowledge, namely:

I. Physics-Mathematics and Earth Sciences.
II. Biology and chemistry.
III. Medicine and Health Sciences.
IV. Humanities and Behavioral Sciences.
V. Social Sciences.
VI. Biotechnology and Agricultural Sciences.
VII. Engineering (DOF, 2018, Cap. IV, art. 12).

The evaluation of the aspirants to belong to the SNI and the permanence of those already accepted is done by evaluating commissions (members of the integrated SNI ex professo).

The appointment of a national researcher falls into three categories: Candidate; National Researcher with three levels, and National Researcher Emeritus (DOF, 2018, chapter XIV, article 46). It should be noted that, although there are general requirements for entry / stay in the SNI, each area of knowledge has some particularities. Similarly, the economic stimulus associated with the public recognition granted by the federal government through the SNI to researchers is applied according to the category or level.

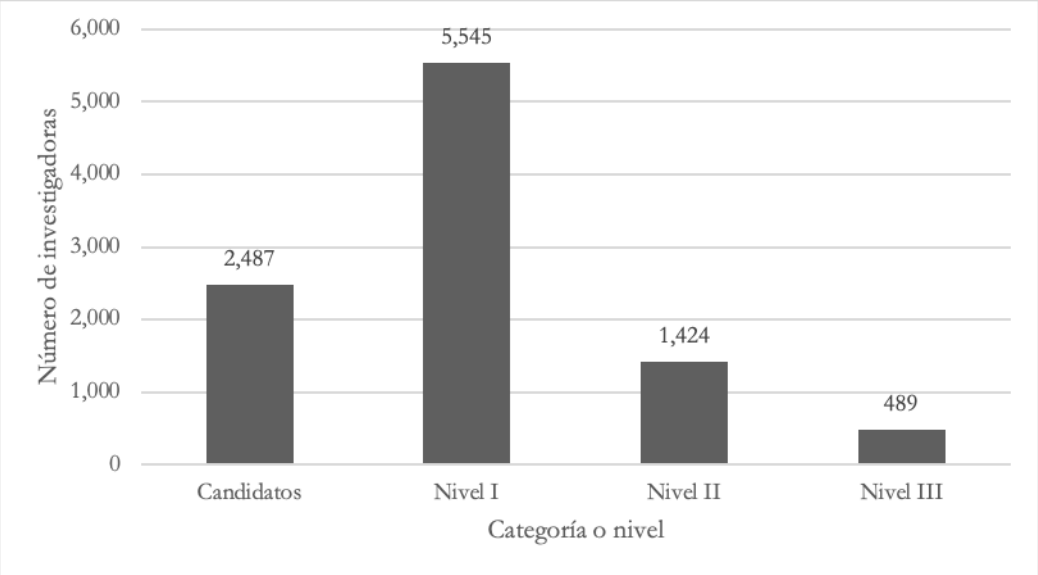
In the history of the SNI, the members have grown exponentially, since they have gone from 1396 in 1984 to 27 186 in 2017, which shows, in 33 years, a growth multiplied by almost 20 of its original number. Likewise, a trend towards decentralization has arisen, while in 2009 39.5% of SNI researchers were attached to institutions in the Mexican capital, in 2010 it was reduced to 38% (Didou and Gérard, 2010), and more currently only 31.63 % are located in Mexico City. In this context, public higher education institutions are the ones that concentrate the largest number of researchers, among which the UNAM stands out with 4598, the National Polytechnic Institute (IPN) with 1200 and the Autonomous Metropolitan University (UAM) with 1170, which together they represent 25.61% of the researchers members of the SNI in 2017.

However, in terms of sex, the number of women is so far lower than the number of men, and although there is a perceptible huge feminization of the members of the SNI (Didou and Gérard, 2010), the number is still lower, as shown the following figures: in 1984, of a total of 1377 SNI researchers, 283 were women, which represented 20.5% of the total population. For 2004, with a substantial increase in researchers of more than 700%, 10 140 members of the system were reported, of which 3332 were women, almost 33% of the total number of researchers. The above shows that the participation of women rose in 20 years from 20.5% to 33% (Sánchez, 2015). For 2014, 30 years later, the numbers reflected a greater increase when 7443 women registered 21 379 members of the SNI (García, 2015).

With the cut made on February 1, 2018, from the information reported in the database of beneficiaries of the SNI of 2017, a total of 27 186 members are cited; of them, 9945 are researchers, that is, 36.58%. Percentage lower than that of the researchers (63.42%), despite the fact that there has been a notable increase compared to the 283 researchers in 1984.

The 9945 researchers are present in most of the categories or levels of the SNI, as can be seen in figure 1. In level I, more than half of them are concentrated, followed by those located in the Candidate level.

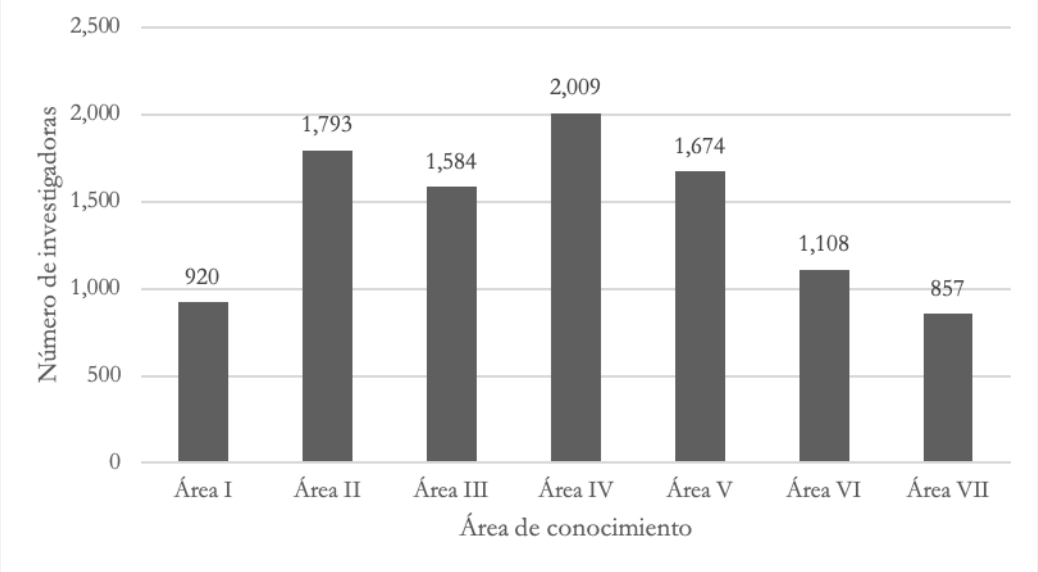
Figura 1. Distribución de las investigadoras del SNI por categoría o nivel



Fuente: Elaboración propia con base en el SNI (2017)

Regarding the areas of knowledge, the SNI researchers are distributed in all of them in the manner shown in figure 2. The greatest concentration in area IV stands out. Humanities and Behavioral Sciences, in contrast to areas I. Physical-Mathematics and Earth Sciences and VII. Engineering

Figura 2. Distribución de las investigadoras del SNI por área de conocimiento



I. Físico-Matemáticas y Ciencias de la Tierra; II. Biología y Química; III. Medicina y Ciencias de la Salud; IV. Humanidades y Ciencias de la Conducta; V. Ciencias Sociales; VI. Biotecnología y Ciencias Agropecuarias; VII. Ingenierías.

Fuente: Elaboración propia con base en el SNI (2017)

If the data of the researchers are compared with those of the researchers, by category or level of the SNI, both are distributed in a similar way in level I and II. While in level III the distance is notorious (see table 1).

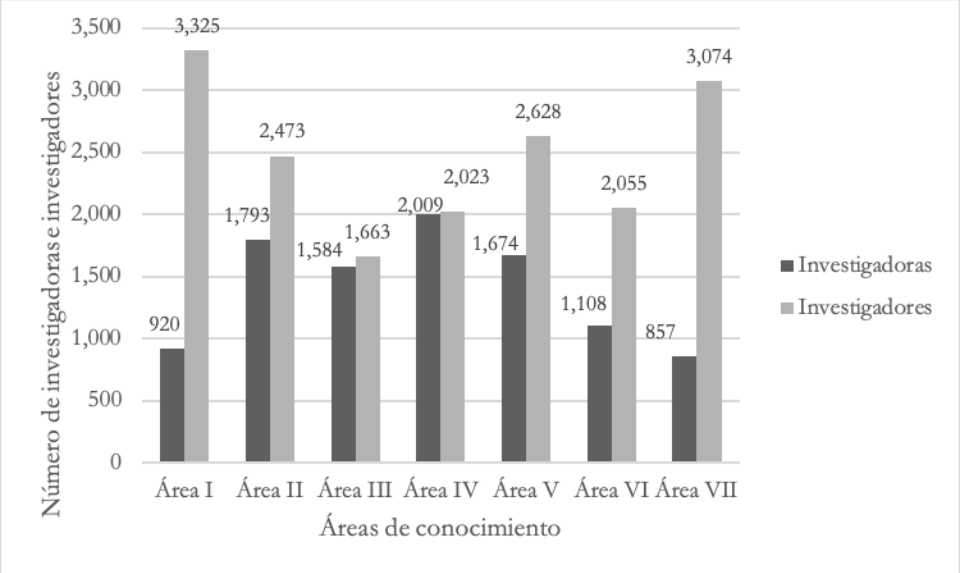
Tabla 1. Distribución de las investigadoras e investigadores SNI por categoría o nivel

	Candidato	**Nivel 1**	**Nivel 2**	**Nivel 3**	**Total**
Investigadoras	2487	5545	1424	489	9945
%	8.9 %	20.39 %	5.23 %	1.79 %	36.31 %
Investigadores	3330	9117	3028	1766	17 241
%	12.2 %	33.53 %	11.13 %	6.49 %	63.35 %
					27 186

Fuente: Elaboración propia con base en el SNI (2017)

By area of knowledge, the investigators of the SNI are distributed as shown in figure 3, where N = 27,186. In the case of the latter, area IV. Humanities and Behavioral Sciences concentrates the largest number; while with respect to the former, there is greater concentration in area I. Physical-Mathematics and Earth Sciences.

Figura 3. Distribución de las investigadoras y los investigadores del SNI por área de conocimiento



I. Físico-Matemáticas y Ciencias de la Tierra; II. Biología y Química; III. Medicina y Ciencias de la Salud; IV. Humanidades y Ciencias de la Conducta; V. Ciencias Sociales; VI. Biotecnología y Ciencias Agropecuarias; VII. Ingenierías

Fuente: Elaboración propia con base en el SNI (2017)

Regarding the affiliation institutions of the researchers, for 2015 Eugenio Cetina, director of the SNI, reported the data shown in table 2. It is located 888 private universities, representing 4% of the total of the institutions cited , and a growth of 302% compared to 2000, where there were only 221 private universities; that is, 3.1% of the total of the universities attached at that time.

Tabla 2. Comparativo de número total de SNI en las instituciones de adscripción

Sector	2000	2015	Crecimiento %
USES	1435	8383	484
IES Fed	3646	7471	105
CPI – C	750	1883	151
SSFed	546	1480	171
UPart	221	888	302
CPI	374	741	98
Ext	63	611	870
TNM + ITD	92	565	514
Otras	336	1294	285
TOTALES	7463	23 316	212

USES: Universidades Subsectorizadas en la SES. IES Fed.: UNAM, UAM, IPN, Cinvestav, Colmex, UPN. CPI – C: Centros Públicos de Investigación Conacyt. SSFed: Institutos Nacionales de Salud, SSA, IMSS, Issste… UPart.: IES Particulares. CPI: Otros Centros Públicos de Investigación (IIE, IMP…). Ext.: Instituciones en el Extranjero. TecNM: Institutos Tecnológicos Estatales (Desc. Gob. Edo.). Otras

Fuente: Cetina (2015)

Table 3 classifies the number of researchers considering seven private universities. In her, the Technological Institute and of Superior Studies of Monterrey (Itesm) has the greater number of investigators and the University of the Valley of Mexico (UVM) the minor. While the Universidad Panamericana (UP), context of this research, has 28 female researchers as of February 2018, which represents 8.68% of the researchers assigned to the private universities listed, so it ranks fourth in descending order.

Tabla 3. Número de investigadoras en instituciones de educación superior particulares

	Institución de educación superior	**Número de investigadoras**	**%**
1	Itesm	173	53.5
2	Universidad Iberoamericana	48	14.88
3	Universidad Anáhuac	39	12.08
4	UP	28	8.68
5	Instituto Tecnológico Autónomo de México	16	4.95
6	Universidad La Salle	13	4.04
7	UVM	6	1.87
	Totales	323	100

Fuente: Elaboración propia con base en el SNI (2017)

Once the place occupied by women within the SNI and specifically in private universities is analyzed, the methodology of this study and the specific context of this research are presented below.

Methodological framework

This research is part of the interpretative paradigm and the qualitative approach, with a phenomenological perspective. As Merriam and Tisdell (2016) state, qualitative studies "seek to discover and understand a phenomenon, a process or the perspectives and worldviews of the people involved, how people interpret their experiences and what meaning they attribute to them" (p.15). In this case, we seek to answer the following question: What are the experiences and challenges faced by the researchers belonging to the SNI for admission, permanence and promotion within the system? That is to say, what interests to stand out is the look of the investigators.

It was considered to resort to a phenomenological perspective, since from this one seeks to know reality as others see it and experience it (Taylor and Bogdan, 1994). Patton (2015) explains that phenomenology seeks to understand how people describe and interpret experiences. In this

way, we examine the way in which others experience the world. What matters is what people perceive as relevant, since the meaning that the protagonists give to their actions is considered preferable (Tójar, 2006). Also, from this perspective, it is considered that human beings are linked to their world and, therefore, emphasis is placed on the lived experience, which appears in the context of relationships with objects, people, events and situations. (Galeano, 2004).

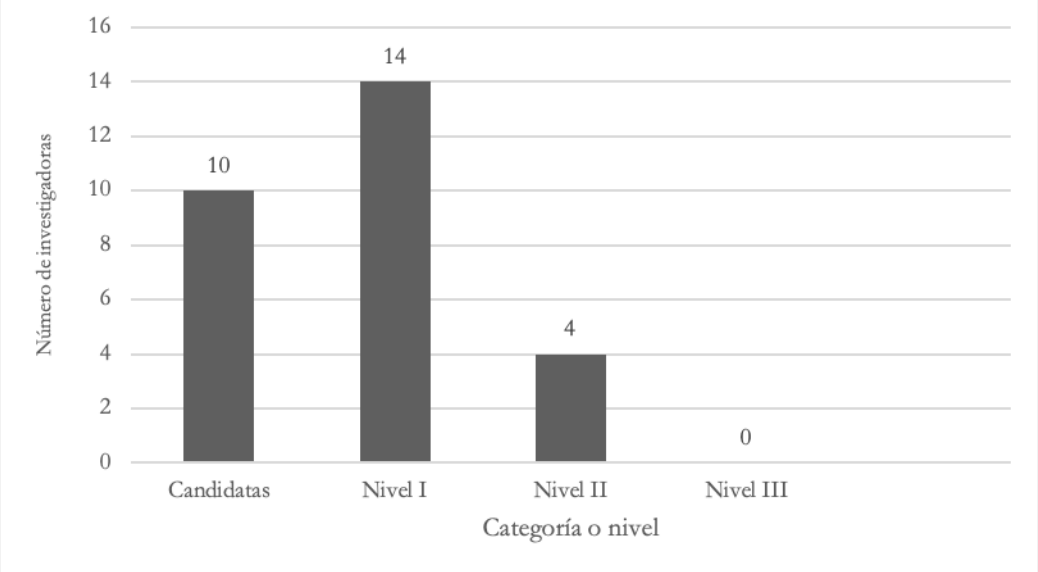
Research context

The UP, in 2018, had 113 teachers belonging to the SNI, of which 85 were men and 28 women, that is, 24.77%. The average age of the researchers was 47, similar to the national average according to the study by Didou and Gérard (2010), and there was a range of 70 to 32 years, the latter being the youngest researcher. Regarding the academic training of the researchers, 43% did doctoral studies in public universities, while 57% in private higher education institutions. Likewise, 43% of the researchers studied in foreign universities and 57% in national institutions.

The year of entry into the SNI of the UP researchers began in 2000. And just more income is appreciated thereafter, which is a reflection, first, of the policies of the National Council of Science and Technology (Conacyt), which as of 2008 contributes 30% of the economic stimulus to researchers affiliated to higher education institutions, and since 2014 contributes 100% of this. And, secondly, the strengthening of UP policies to favor research recognized by peers and certified by Conacyt (UP, 2018).

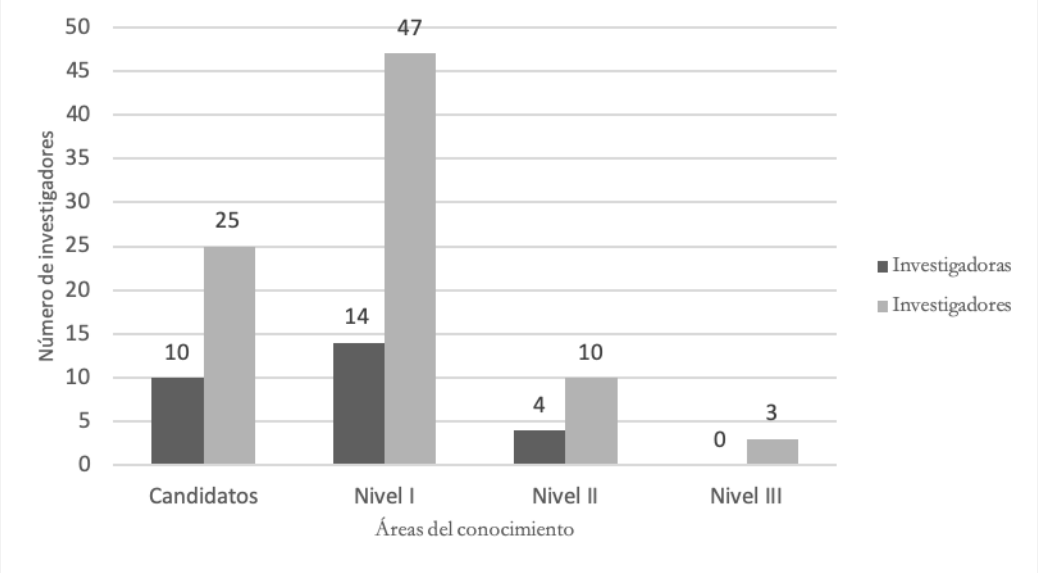
Regarding the level they occupy within the SNI, 10 are candidates (36%), 14 are level I (50%) and 4 are level II (14%). There is still no researcher in the UP at level III (see figure 4), as it does in the case of researchers, since there are three UP representatives at the highest level (figure 5).

Figura 4. Distribución de las investigadoras SNI de la UP por categoría o nivel



Fuente: Elaboración propia con base en la UP (2018)

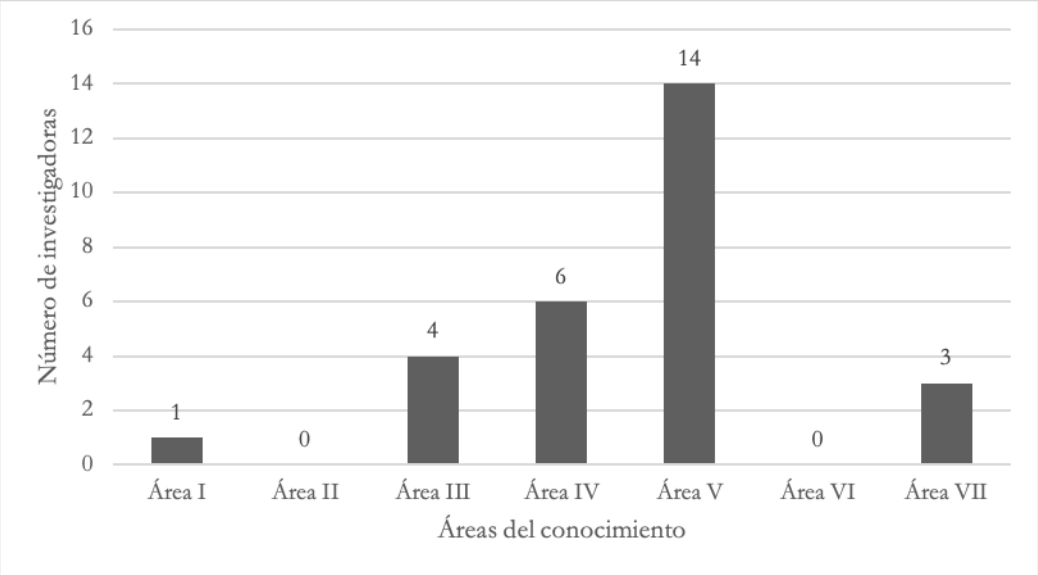
Figura 5. Distribución de los investigadores SNI de la UP por categoría o nivel



Fuente: Elaboración propia con base en la UP (2018)

In figure 6, on the other hand, the area of knowledge to which the researchers belong is shown. As can be seen, there is a greater concentration in areas IV. Humanities and Behavioral Sciences and V. Social Sciences, and a smaller number in the areas I. Physical-Mathematics and Earth Sciences and VII. Engineering

Figura 6. Distribución de las investigadoras SNI de la UP por áreas de conocimiento



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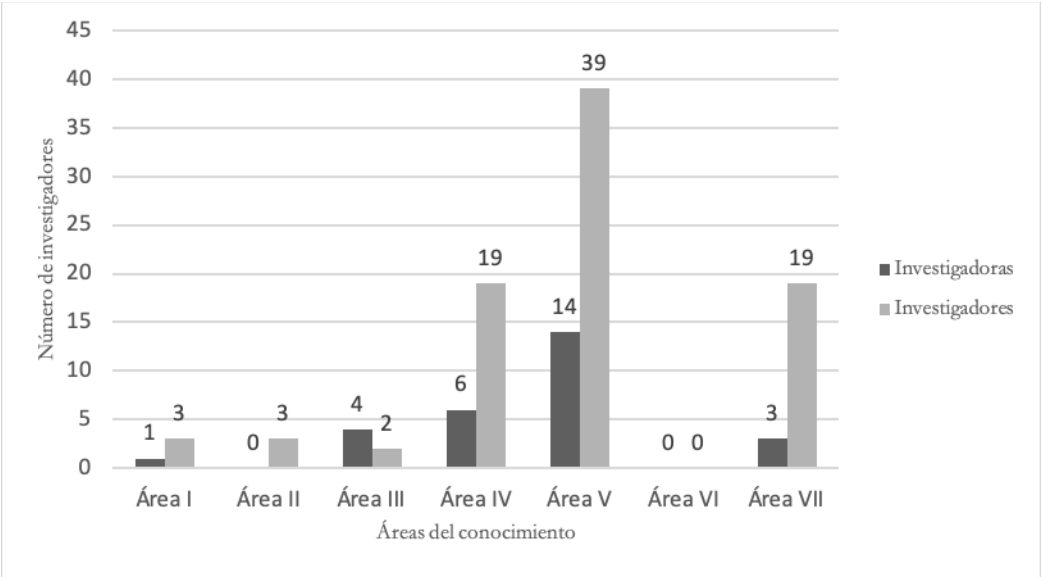
Fuente: Elaboración propia con base en la UP (2018)

It should be noted that there is no participation in areas II. Biology and Chemistry and VI. Biotechnology and Agricultural Sciences. Coincident with the fact that in the UP there are no bachelor's or postgraduate degrees that profile those fields of knowledge. Contrast with the male researchers of the UP, these are also distributed mostly in areas IV. Humanities and Behavioral Sciences and V. Social Sciences and to a lesser extent in area I. Physical Mathematics and Earth Sciences and in VII. Engineering, although it should be noted that in area III. Medicine and Health Sciences the researchers double the number of researchers (figure 7).

Figura 7. Distribución de los investigadores SNI de la UP por áreas de conocimiento



I. Físico-Matemáticas y Ciencias de la Tierra; II. Biología y Química; III. Medicina y Ciencias de la Salud; IV. Humanidades y Ciencias de la Conducta; V. Ciencias Sociales; VI. Biotecnología y Ciencias Agropecuarias; VII. Ingenierías

Fuente: Elaboración propia con base en la UP (2018)

Participants

Of the 28 SNI researchers with whom the UP has, participated in this investigation 9, which were chosen by a non-probabilistic sampling, for convenience, responding to the following criteria: different areas of knowledge; ages and years working in the university. To know these data, a questionnaire was applied electronically, which was answered by 23 of the 28 researchers (82.1%).

Regarding the areas of knowledge, seven belong to the area V. Social Sciences, of which two belong to the School of Communication, two to the Faculty of Law, two to the School of Economic-Business and one to the Faculty of Engineering . One to area IV. Humanities and Behavioral Sciences, which is attached to the Faculty of Philosophy, and another to area III. Medicine and health sciences, belonging to the School of Medicine. The ages fluctuate between 34 and 62 years. While the years working in the UP range from 1 to 30.

Another fact of relevance for this research is that of the 9 interviewed 7 are married and with children between 6 months and 18 years.

Compilation of information

For the collection of information, the semi-structured interview technique was used based on the following trigger questions: what challenges have you faced for admission, permanence and promotion within the SNI? How have you combined your personal life with your work as a researcher? ? How have you combined other activities of your professional life with your work as a researcher? What have been the supports that you have received from your university to be a researcher?

Nine interviews were conducted individually, because, as Robles (2011) suggests, this allows establishing a bond of intimacy and complicity with each interviewee in such a way that they share their experience with greater confidence. The interviews lasted between 30 and 50 minutes and were recorded on audio for later transcription. The above with the permission of the interviewed to meet the confidentiality criterion.

Analysis of the information

Even though the qualitative method chosen for this work is phenomenology, the proposal arising from grounded theory was considered for the analysis of information (Strauss and Corbin, 1998), which suggests the method of constant comparisons. The previous decision was made due to the following note:

> The nature of research questions guides and guides the process of inquiry and, therefore, the choice [and combination] of some methods or others (...), research methods arise under the conceptions and needs of researchers working from a specific discipline of knowledge (Rodríguez, Gil y García, 1999, pp. 40-41).

The method of constant comparisons combines the inductive coding of categories with the constant comparison between them in three moments: open coding, axial coding and selective coding (Strauss and Corbin, 1998). Thus, after reading several times each of the interviews, units of meaning were identified, which were grouped into categories of analysis, which were interrelated,

integrated and refined in a higher level of abstraction (Creswell, 2002). To carry out the above, an inductive and dialectical process was followed, which is described below.

At first, a detailed reading of the interviews was conducted in order to have a general idea of the content of these and identify the main issues addressed in the discourse of the protagonists. Subsequently, segmentation was carried out in units of meaning. This segmentation was done considering the fragments that reflected similar ideas (open coding). Each unit was identified with a consecutive number and an identifier of the researcher interviewed, so I1 represents the first participant, I2 the second, until I9 the last.

As the analysis progressed and new units of meaning appeared, they were compared with the previously created categories to include them in one of them. If any of the units did not match those already created, a new category was defined and relocated (axial coding). Finally, a purification of the codes created and assigned to the units of meaning was carried out, which allowed merging similar categories and redefining labels that would be better suited to the content.

Once this procedure was done with each of the interviews and the theoretical saturation was reached (Strauss and Corbin, 1998), that is to say, no units of meaning appeared other than those located in the subcategories, categories and metacategories already configured and they had varied and sufficient information, the decision was made not to carry out more interviews.

Validity and credibility

Lincoln, Lynham and Guba (2011) and Merriam and Tisdell (2016) they propose as care methodological rigor in conceptualization, data management and presentation of results. To establish the validity and reliability of the results, the following procedures were performed:

1) Once the interviews were transcribed, the participants had the opportunity to review them in order to approve or modify the information. This technique is described by Lincoln and Guba (1985) as the most important to establish credibility.

2) In addition to the above, the categorization process previously described was carried out in a collegial manner by the authors of this research and considering the criterion of theoretical saturation. Patton (2015) suggests that the comparison technique that involves more than two people analyzing data and results promotes credibility.

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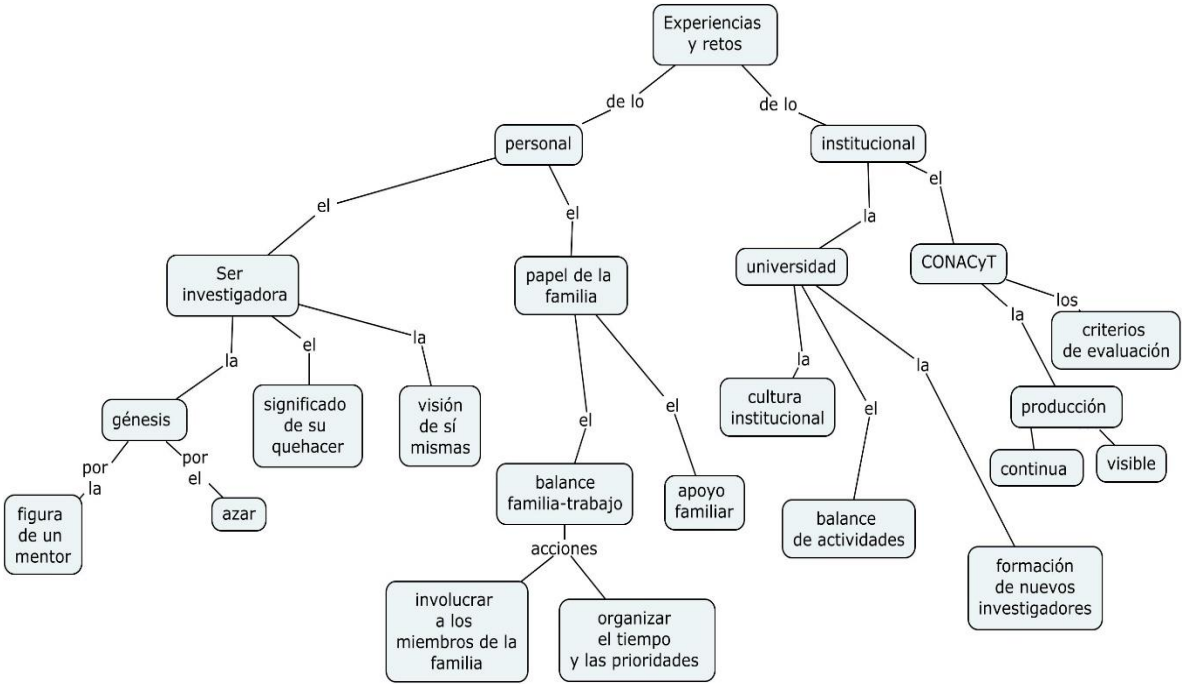
Results

The participants shared reflections about their personal and professional experiences as researchers belonging to the SNI. They perceived some challenges both at a personal and institutional level and from the system itself, and also talked about how the culture that privileges men has an influence on their development as researchers.

Considering the criteria of the theoretical saturation described above, two metacategories emerged in the analysis of the information: the personal and the institutional, within which categories and subcategories were generated, which can be observed in the semantic map of figure 8.

Figura 8. Categorías y subcategorías de análisis



Fuente: Elaboración propia

For the presentation of the categories, the units of meaning that best represent the proposed idea were selected.

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On the personal

This metacategory is made up of two categories. On the one hand, the very being of the researcher, where reference is made to the experiences that the participants have lived and that have led them to become researchers, in addition to the meaning that they have for them to dedicate themselves to this and how they define themselves same within this work. On the other, the role of the family, in which difficulties were found at one extreme to achieve a balance between family life and work, and at the other, the importance of family support in their professional career.

Within the first category, the very being of the researcher, a first theme shows the genesis of how it was envisaged to dedicate oneself to this. In it there are two tendencies. First, the figure of a mentor that refers to a university professor, which inspired the professional career:

> My decision to be an investigator was motivated by a teacher of the degree (...), I started working with her and I saw what she was doing and I thought she was a happy woman, that she was very passionate about what she was researching (...) and I thought that It could be a way of living, of doing what you're passionate about (I1).

In the same vein: "When I studied undergraduate there was a teacher who loved how I taught, who worked as a film, then when I finished my degree I wanted to do an investigation about cinema" (I4).

And secondly, this decision is more the result of chance and circumstantial circumstance: "I started as a researcher rather empirically because I left a position in government and decided to devote myself to study and research and started writing" (I5). "Once I graduated, I started working in a university as a research assistant, the truth is a bit by chance, then it was when I began to know that medium and to become familiar with it" (I8).

Beyond the reasons why they decided to be researchers, each of the participants gives meaning to their work. From this, this profession is understood as an arduous, full-time job that seeks to influence society through the generation of knowledge, all from a continuous questioning of reality, where responsibility plays a role fundamental. "It's a very hard race that lasts until your last day but you also build with a lot of mistakes, stumbles and then you get up and tell yourself that happens" (I1).

> It means a full-time job, that is, all the time, even if you are not doing research properly, you are reading and you are thinking. You see a phenomenon and you say "there is a research thing", that is, you already bring it, it is like a chip that you install at some point and you can see everything with those eyes (I4).

"To be a researcher is to have a positive impact on society" (I6). "It means a challenge, it is the first word that comes to me; it means contributing to the ladder referring to knowledge; it means a lot of work and a lot of dedication" (I7).

> Not being satisfied, implies that desire to be constantly questioning things, to understand why or maybe break with stereotypes that you have mentally. Being a researcher also implies a responsibility, there are limited resources and therefore it is necessary that those resources are put to work on things that are going to be of some relevance (I9).

In the same way they shared that more than genius, the important thing is the perseverance and the hours dedicated to the research work. "Because many times it is not the brilliance of the idea, but the amount of hours you invest in one thing" (I1).

Now, what is their view of themselves as researchers? They perceive themselves as activists oriented to solve environmental problems under quality standards.

> I do not believe that it has an absolute methodological solidity, but I do believe that I try to be profound in research (...). But, in addition, I believe that I am an activist, because I also believe that as a lawyer, and if one is on issues of telecommunications that affect society, then you can not sit idly by (I5).

“I would define myself as a researcher that what you are looking for is that you can land the research products” (I6).

> I define myself as a researcher who is doing quality things, doing quality research. But also as a woman, indeed, you have many challenges, because you have many trenches that you also have to cover and then it is a challenge day by day (I7).

According to the previous testimony, it is about women with different roles to attend, which gives guidelines to the next category, the role of the family in professional development, where they consider the balance of family life and work as a major challenge in her career as researchers.

"It is not easy, I wife, children, home, work and PhD, because it was really difficult" (I2). "The uncertainty about how to overcome the difficulties of reconciling family and work life with this commitment in tow made it difficult to deliver the application" (I1).

> Personally, my husband does not live with us, he is a military man, so I am like a single mom and I have to take care of the girls, come to work and dedicate myself to research (...). The difficult part is that the children understand what you are doing: "mom and what are you doing", "is that I have to deliver this work", "but who do you have to deliver it to?" (I4).

However, in order to face these challenges they have carried out certain actions such as involving the family in their academic life: "I explained [to my children] what it would involve [applying to the SNI]. The bigger one asked me if they were going to give me money, and I said yes, and it seemed more interesting "(I1). "My children grew up with it, they saw me studying ... yes, they are very used to seeing their mothers studying, going to congresses, they are very familiar [with academic life], for them it is very normal" (I2).

> Even my daughters told me "Hey, mom, some lion movies came out, why do not you do a job about lions in the movies? Because look, the lion king is here, then an Italian came out and then they said to me: you already have two more movies, why do not you do an investigation (I4).

As well as organize your time and set priorities:

> What I tried was to apply, say, the logistical knowledge to achieve everything. For example, I live a block and a half because I could not afford to steal my children's time for being in traffic, so I have eaten with them all my life. (I6).

And in that same sense:

> Being a mom makes me more efficient in the use of time and then, as I know that it is six hours that I have, because it is six hours that I have to get all the juice; same and before you arrived and you read the newspaper and you are that if the emails and now is to optimize the time (I9).

Coupled with these actions, is the family support they receive, which is not reduced to the spouse, but extends to the extended family, such as siblings, parents and grandparents.

> I went to live with my mother in Mexico City to do my doctorate. Always against all odds. [My husband] went with me to the city and we were him, my son and me. And I studying (I2).

"What my husband and I have done is align ourselves to live together and at the same time stay in the care of the children when the other has to work" (I6). "My husband is also fortunately supporting me a lot because he has greater ease. He has supported me a lot in this part of the handling of children and other issues" (I7).

> Right now my sister helps me take care of the baby and then my mom will take a reduced load of teaching and she will also help me, especially so that she arrives after six months and then I enter the nursery (I9).

"I left my children a lot of time, my grandfather and my husband helped me, so that it would not end, so I finished [the doctorate]" (I8).

Just as the family is seen as a challenge and as a support, the institutional environment also shows two poles of the same phenomenon.

On the institutional

In the metacategory of the institutional, the researchers face the culture and policies of two different institutions: the university to which they are attached and the SNI itself.

Regarding the university of affiliation, the participants identified three main challenges: the institutional culture, the balance in management activities, teaching and research and the training of new researchers.

The participants describe that the institutional culture of research has often been a challenge to solve, since the university emerged oriented to teaching and it was thought that research was a contingent activity and, therefore, lacked support.

> The research is perceived as something that you do because you like, as a hobby, what you do in your spare time, and I think it is normal because this university was born from undergraduate degrees and is thought very from the teaching (I1).

And in that same item:

> It was very difficult, because they did not understand exactly [the directors], they were administrative, without belittling anyone, they did not see the projection of the university in the generation of knowledge. They did not value the importance of the investigation. Fortunately everything has changed for good (I3).

Further:

> The issue is that when you are in administrative positions you have a lot of movement during the day, that is, they are called, "bombs", and then to investigate you need quiet time, alone, where the phone does not ring, because you also need continuous hours (I6).

However, it is also perceived that things are changing and there is greater institutional support, because policies have been generated that benefit the researchers..

> It has made me less complicated from this series of policies where I can dedicate hours exclusively to research (...). I was working in management positions, but just when I entered the SNI they took them away (I4).

"If I told them that I want to put a brake on the administrative career to devote more to research, I think there would be no problem (...). So, in that sense, I feel totally supported "(I6).

Although the policies have helped to improve the institutional conditions for the development of research, the issue of the training of new researchers still needs to be resolved, since the university has few doctorates and the majority of the master's degrees are professional, so the participants have great difficulty to have thesis. "The thesis management, because there are not many postgraduate students, and not all choose to do thesis" (I8). "Now that the university provides other forms of certification, the theses fall to gout and that is very close to what is expected of us in the SNI, because the SNI asks you to form resources" (I9).

The criteria that SNI promotes are added to the institutional issues of the university.

The purpose of the SNI is to strengthen the quality of research. The evaluation that it promotes affects the dynamics of both higher education institutions and academics. One of the biggest challenges, according to the participants, is maintaining a continuous and quality production that is published in international journals, refereed and indexed. "It is definitely a

challenge to have a continuous production and 'certain' production, that is, a task within certain parameters" (I3). "Well, I believe that the challenges have to do with increasing production, that there also, let's put it in parentheses, the university raises Scopus, and some of those things that are in Scopus because they are not in Conacyt" (I4). "You have to learn to say how many I'm going to publish, in which magazines, find your information, adjust to the times, put together the amount that Conacyt asks you if you want to upload, or if you want to keep yourself" (I8).

In addition, the researchers share that a visible production that is cited by other colleagues is required. Given this criterion of visibility, another challenge arises: "I do not have too many people who cite me because in Mexico [my subject] is little explored; I think that is one of the reasons why I have not been able to level up in the SNI" (I3).

> You have to ask the judges that when they have cited you, the authorities that warn you; and then you end up dedicating a month of your life to see who quotes you, and then the opposite argument is "then write in Scopus", but it is not so easy because if it is not open source, who will quote you. My most cited works are my books that I have there open (I5).

In reference to the evaluation criteria of the SNI, both positive and negative aspects were found. As for the positives, the participants share how the system helps them focus the research. "[The system] is very well put together and thought to work, because [requests] networks of research, teaching, dissemination, going to congresses, training new researchers" (I1).

> Go learn that you must be measured, that it costs us and when you measure, you put yourself your goals, or say: this year I will try to publish four, you know that of those four at least not you accept two and two are going to be in process, then suddenly you also realize that you have to be efficient (I8).

On the other hand, in the negative aspects, the researchers acknowledge that the SNI criteria restrict research.

> As in any evaluation and accreditation system, the SNI orders actions and goals so that the research work, and the publications, are oriented to the Conacyt's own requirements, and not always to what the researcher wishes to do. (I3).

In addition to the mentioned challenges, the participants describe how the culture that privileges the male permeates the academic and scientific fields, which creates an extra burden to the challenges already presented.

> But what I believe is that in general research, lines of research, have been born of male minds, there has been little participation of women and we have a very different voice to contribute ... I also think, I told my boss at the time, I was paying as a doctor and not as a doctor (I1).

"I feel that women usually have more administrative burdens, but it is because we are very good, so you do see men who maybe have a lot of free time and you are full of thousands of things" (I6).

Although some researchers also recognize that there has been some progress in this regard:

> Anyone who thinks about gender discourses can see, but I think there are other things that are not generally said, in the SNI there is a license for motherhood, without economic stimulus, but there is (I1).

Another testimony mentions the following regarding this same point: "My boss always supported me, there were those who objected because they said that he was not going to return, he is a woman, he is not head of the family, because she was married, etc." (I2).

Once the analysis of the information has been presented, the final considerations that emerged from the interpretation of the results are given below.

Final considerations

While there are works on women researchers in the field of public universities, the space of individuals is shown as an area of opportunity. This is how this study turns out to be a first approach to answer this knowledge gap. Among the most relevant findings about the experiences and challenges of the SNI researchers, it can be said that, both in public universities and in private individuals, women find a challenge in the balance of family life and work, such and as is evident in the category of the role of the family, where reference is made to the difficulties in this area.

However, the interviewees have overcome this challenge with actions such as involving the family, organizing time and priorities, although the most important thing has been to have family support,

which contrasts with other realities shown in the literature, where women express not having precisely this support.

Turning to acting professionally, there are two common challenges: the difficulties for scientific production and the training of new researchers, which in public universities are due to lack of time as a result of activities such as motherhood and family care. While, in this case of study, the first is a consequence of the times for revision, publication and indexing; and the second, due to the lack of postgraduate courses oriented to research at the university of affiliation.

Another aspect that is different between public universities and this case study is in relation to the age range within the SNI, which ranges between 45 and 55 years, and although the average age of the SNI women in this study It is 47 years old, highlighting the participation of 5 researchers under 35 years of age.

After having made a comparison between experiences and challenges of the researchers in public universities and this case, namely, about a particular university, now reference will be made to how the university where the study is carried out has been modifying the culture in around research and, therefore, creating institutional policies that favor this practice. The above is evident in the information provided in the interviews where the researchers with the most experience within the university are pleased to see how things are changing, while for the new ones this support is natural.

The triggering action was the creation in 2016 of the Institutional Direction, of the vice-rectories in each campus and of the research secretariats in each school and faculty. From that organization, they began to configure policies to encourage visible scientific production, to support research projects through an annual fund in which they are presented for evaluation and subsequent support. In addition to the creation of an institutional repository for the dissemination of the scientific production of the university and the development of the Management System for Research.

Despite the efforts made in this area that have allowed to strengthen the research practices in the university, there are still lines of action to address the challenges expressed by the researchers, such as the training of new researchers.

On the other hand, as regards future lines of research, it remains in the inkwell at first to give researchers a voice in order to know their experiences and challenges, and in a second moment, to carry out a comparative study between women and men, and identify differences and similarities.

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