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DOES MATERNITY AFFECT WOMEN'S CAREERS? PERCEPTIONS OF WORKING MOTHERS IN ACADEMIA

(¿INFLUYE LA MATERNIDAD EN LA CARRERA PROFESIONAL DE LAS MUJERES? PERCEPCIONES DE MADRES TRABAJADORAS EN LA ACADEMIA)

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ABSTRACT

Women in academia are underrepresented at the highest levels of the hierarchy. After gaining their PhDs, they seem to make little progress and their career paths appear to be hampered by their family responsibilities. Motherhood can affect scientific productivity and, therefore, promotion. Balancing teaching, research, administration, consultation, and other roles in academia with maternity can be hard. This study comprises an online-survey of mothers with children up to 5 years old, working in academia (n=80) in a Spanish university (University of Murcia), the aim being to ascertain their views regarding maternity and work. Common themes include a greater focus on teaching than on research, handicaps regarding mobility, and working from home. 63% perceived that their CVs are less competitive than those of their co-workers who are not mothers, which

implies that their research productivity decreased. However, even with these difficulties, the results show that more than half are confident they will soon receive promotion. In order to reduce the existing glass ceiling, actions and policies that promote equal access and promotion to the scientific career, integrating working life and family care must be implemented.

KEYWORDS

Academic career, academic promotion, gender, motherhood, work–family balance

RESUMEN

En el ámbito universitario y de las instituciones de investigación, las mujeres tienen una baja representación. Después de obtener un doctorado, parecen progresar poco y su carrera profesional se ve obstaculizada por responsabilidades familiares. La maternidad puede afectar a la productividad científica y, por lo tanto, las posibilidades de promoción. Equilibrar las tareas de docencia, investigación, gestión y otros roles dentro de la academia con la conciliación cuando se es madre puede resultar difícil. El estudio que se presenta comprende una encuesta online que se ha realizado a madres recientes (con hijos de hasta 5 años) que trabajan en una universidad española, concretamente en la Universidad de Murcia (n=80), con el objeto de conocer sus puntos de vista sobre la maternidad y el trabajo que realizan. Los resultados demuestran que estas científicas se inclinan por una mayor dedicación a la docencia que a la investigación, presentando desventajas con respecto a la movilidad y el trabajo desde casa. El 63% percibe que su currículum vitae es menos competitivo que el de sus compañeras de trabajo que no son madres, alegando que su productividad en investigación disminuyó por el hecho de su maternidad. A pesar de estas dificultades, los resultados muestran que más de la mitad confía en que pronto tendrán posibilidades de promocionar. Con el objeto de disminuir el techo de cristal existente, se deben implementar acciones y políticas que promuevan la igualdad de acceso y promoción a la carrera científica y que integren la vida laboral y el cuidado familiar.

PALABRAS CLAVE

Carrera profesional, promoción, género, maternidad, conciliación familiar y laboral

INTRODUCTION

In recent years there has been much debate on gender inequality and women's rights. In academia, this debate is linked to underrepresentation and poor chances of promotion for women. A great deal of attention has been paid to quantitative gender differences, such as the number of women in higher education and differences in career advancement, remuneration, research productivity and awards. The glass ceiling effect is clear in the low representation of women in decision-making in academia.

The European Commission (EC) and the Women and Science Unit regularly publish reports on gender equality in research (for example, She Figures) in the European Union (EU). These, together with those published by the European Technology Assessment Group (ETAN, 2001), point to discrimination against women in the policies and practices of EU scientific institutions, which prioritize gender over personal excellence. In 2015, female researchers represented 28.8% of researchers worldwide, including both full-time and part-time employees (UNESCO Institute for Statistics), and are mainly in the younger age groups (under 35 and 35-44) (European Commission [EC], 2018a).

In Spain, twice a year the Ministry of Science, Innovation and Universities publishes "*Cientificas en cifras*", the national series of She Figures. Other examples are publications by the *Instituto de la Mujer* (2006) on gender disparities in the Spanish Research Council (CSIC), although this focuses on permanent positions rather than fixed-term contracts or PhD students; and also the study by García de León et al. (2001) on the professional careers of women and men in Spanish universities, which does not focus on parenthood.

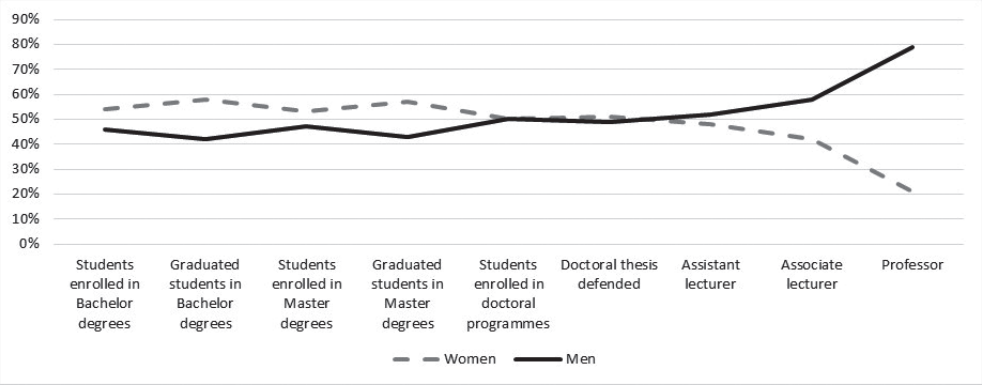
BALANCE OR IMBALANCE BETWEEN FEMALE AND MALE ACADEMICS

Despite a rising proportion of women at the different levels of the academic career ladder, women are still a minority at the top of the hierarchy (European Institute for Gender Equality [EIGE], 2016a; EC, 2018a), especially in professions relating to STEM (science, technology, engineering and mathematics). Female researchers seem more likely to work in the field of medical sciences or social sciences, while male researchers seem more likely to work in natural sciences, engineering and technology. Women are particularly underrepresented among academic gatekeepers and in leading positions in research organizations.

In Spain, the Fundación Española para la Ciencia y la Tecnología (FECYT, 2005) showed that there are no differences in academic production between women and men at the same professional level but, as they scale the academic ladder, the number of women constantly decreases. In Spain, the proportion of women working in academia has remained at 39% since 2009, above the EU figure of 33%. In 2015, 13.9% of full professor positions in Spanish public universities were occupied by women (Puy Rodríguez, 2016), and the figure rose to 21% in 2017. Men occupied 52% of permanent positions and held 56% of fixed-term contracts for academic staff in universities (Educabase). The latest data indicate that women account for 8% of University Rectors and 41% of Vice-Rectors, 29% of faculty deans and the same percentage of department heads (Puy Rodríguez, 2018). Regarding academics working in STEM, there are nearly five times more men than women (EIGE, 2018).

In Spain, the slow growth in the number of women in professional academic and research positions does not correspond to the speed at which women graduate and achieve doctorates (FECYT, 2005). The number of women studying for Bachelor's and Master's degrees at universities and on PhD programmes is much higher than that of men. 52% of doctoral theses were by women in 2017 (Educabase). As shown in Figure 1, after completing their PhDs, academic women seem to not go forward. This pattern can be seen in other countries as shown by ETAN (2001) and the She Figures (EC, 2015, 2018b). Consequently, feminization in universities refers essentially to students at predoctoral level (Consell Interuniversitari de Catalunya, 2015).

Figure 1
Breakdown of women and men in Bachelor's and Master's studies and research in Spanish public universities, in percentages. 2016-17 academic year



Fuente: Puy Rodriguez 2018

WORK-LIFE BALANCE

The career paths of female academics appear to be hampered by family responsibilities (Fothergill & Feltey, 2003). Women are still doing most of the caring, educating, cooking, and cleaning in homes, although gender gaps have decreased (EIGE, 2018). Scientific profiles, curricula vitae (CV) and, therefore, career promotion are associated with scientific production; that is, publications, conference attendance, participation in R&D projects, etc. Competition is high so scientists usually devote a lot of time to such activities. The average academic works approximately 55 hours/week juggling teaching, research, administration, consultation, and other roles (O'Laughlin & Bischoff, 2005; Lynn et al.,, 2018). This creates tension between their professional and personal lives and finding a balance can be a lifetime struggle (Brown et al., 2002), especially when scientists become parents. They often have to give up almost everything but work and family, particularly when their children are young. The lack of work-life balance can affect mental and physical health and may lead to depression, anxiety and stress, not to mention frustration and uncertainty about their career prospects, especially for early-career women (Ysseldyk et al., 2019).

Mothers in academia, particularly those on the tenure track, have entered a career path on which the workload and evaluation criteria require a permanent commitment of time, energy, and personal resources. Institutional pressure to meet faculty performance criteria and to appear as unencumbered as possible in terms of commitment to the academic role may lead to feelings of failure and guilt for mothers (Fothergill & Feltey, 2003).

Generally, the years of maximum scientific production are those immediately after gaining a PhD (between 27 and 40 years old), which coincide with the biological age for having children. For women pursuing tenure, the demands of children can slow their progress and thus represent a significant trade-off in family-career balance (Lynn et al., 2018). During maternity leave, such women are expected to publish, but domestic responsibilities make it difficult to find time for writing and research. Even though housework is now increasingly being shared between men and women, the care of family and children is mainly associated with women. Many non-tenure academics use evenings and weekends for research, but mothers need that time for childcare duties.

In the USA, more than 40% of women with full-time jobs in science left the sector or started to work part-time after having their first child; by contrast, only 23% of new fathers left or cut their working hours (Cech &

Blair-Loy, 2019). In the EU, 13.0% of women and 8.0 % of men in higher education were working part-time in 2016.

Attendance at academic conferences is a challenge, as women with children must leave them with somebody or bring their children to the conference, thus having limited time to attend sessions and do networking. Mothers who bring children to meetings worry that others will perceive them to be less professional and less committed to the profession (Fothergill & Feltey, 2003). Also, field-based research may create barriers to recruitment of a diverse workforce (Lynn et al., 2018).

However, academia can be seen as a good job for parents with children. It offers a certain degree of flexibility and autonomy, there are no strict working hours and work can often be done at home. But, as already stated, the career model requires working more hours than are stipulated in the contract plus, in some cases, travel and/or relocation.

GENDER EQUALITY PLANS IN ACADEMIA

For all these reasons, several institutions have developed legal frameworks to provide gender equality in academia. In 2018, the European Commission and the Helsinki Group on Gender in Research and Innovation published guidance to facilitate the adoption of targets to promote gender equality in research and innovation (EC, 2018b). One of the recommendations is to seek gender balance in decision-making positions and professorships by means of appropriate awareness raising and training.

Spain has legislation on equality and anti-discrimination in research and higher education and has gender equality plans, at both national and regional levels. Policy strategies cover topics such as career development, parity in decision-making positions, training, work-life balance and fighting gender-based violence (EIGE, 2016c). Also, several organizations and associations have been created, such as the Women and Science Unit of the Ministry of Science, Innovation and Universities and its very recently-created Women, Science and Innovation Observatory, or the Association of Women in Research and Technology (AMIT), which is a very active network for promoting candidates and seeking gender balance on juries for research, conference boards, innovation awards, etc.

Universities are considered to be involved in the challenge to reach a tolerant and equal society. 96% of Spanish universities and research centres (Puy Rodríguez, 2018) and 100% of public universities have a gender equality plan as recommended by the European Institute for Gender Equality (EIGE

2016a, 2016b). In addition, several institutions have created offices, units or labs (such as "Women with Science" at the University of the Basque Country, or the "11 February Group") to analyse gender imbalances while promoting women in science and helping to close the gender gap.

At the University of Murcia, the Equality Office, founded in 2010, carried out its first gender equality plan in 2013. The study showed that, at this university, women take longer to be promoted than men, and that higher up the academic ladder the possibilities of promotion for women are almost non-existent, while men continue their usual tendency.

Although there are policies to deal with this glass ceiling, the number of women in Spanish academia is growing relatively slowly. Childcare is only part of the story. Simply being female has a clear cost for women: those without children do not progress at the same rate as their male peers (Valian, 2009).

MATERIALS AND METHODS

In 2019, the University of Murcia had 2650 academics (of whom 43% were women[1], representing 40.7% of associate lectures and 19% of full professors). It had more than 29000 students (with women representing 62% of those studying for a Bachelor's or Master's degree, and 54% of those on doctorate programmes). In 2017, 61% of doctoral theses were defended by women. Regarding parental leave, between 2014 and 2018, there were 55 maternity leave permits and 6 paternity permits, showing that it is women academics who take leave to take care of their children, as shown also by Serna, Hernández and Mandesi (2012) in 2010.

SURVEY RESPONDENTS

In order to find out the opinions of recent mothers regarding academic careers and promotion at the University of Murcia, a survey with questions on the working life of mothers was sent via the campus email with the support of the Equality Office of the University of Murcia to examine perceptions of family-career balance in female academics with children, from PhD students to full professors in all scientific areas. Respondents were required to have one child or more between 0 and 5 years old.

The survey was administered between October and November 2018. The final sample included 80 female participants working full-time or part-time in different departments.

DESIGN AND PROCEDURE

The survey was divided into seven areas: (1) Personal data—age, number of children, people living at home, age at which they had their children, civil status, level of education and position at the University; (2) Work situation, regarding where they were working (or not) before and after having their children, and if they requested maternity leave, a working hour reduction or a change of work shift; (3) Family situation with the arrival of the baby, if they had help for child care and in the home; (4) Opinion about maternity and paternity leave in terms of duration; (5) Questions related to sick leave due to illnesses of their children; (6) Effect of their maternity in the workplace, how her pregnancy and maternity were seen, could they continue with the same work they did before or did they start working remotely; (7) Probabilities of, and desires for promotion and professional opportunities lost; and (8) Questions about the effect of motherhood on scientific production. Participants were asked about 60 different issues and were encouraged to write open comments and opinions, which many of them did. Descriptive statistics were obtained for each variable to establish percentages.

RESULTS

Table 1 shows the demographic data of the respondents. 76% of participants were married or had a common-law partner. 37% had 1 child and 49% had 2 children. The sample by age of the children was balanced: 14% had children aged under 1 year; 20% aged between 1 and 2; 17% between 2 and 3, 16% between 3 and 4, and 32% between 4 and 5. 84% had their children when they were 30 to 39 years old.

Table 1
Survey respondent demographic data

		n	**%**
Marital status	Married or common-law partner	61	76.3
	No partner, separated or divorced	5	6.3
	With a partner, but living apart	1	1.3
	Living as a couple	13	16.3

		n	%
Children (age)	Between 0 and 1	11	13.8
	Between 1 and 2	16	20
	Between 2 and 3	14	17.5
	Between 3 and 4	13	16.3
	Between 4 and 5	26	32.5
Children (number)	1	30	37.5
	2	39	48.8
	3	9	11.3
	4 or more	2	2.5
Age at which they had their children	< 25	2	2.5
	25-29	7	8.8
	30-34	35	43.8
	35-39	32	40
	40 and above	4	5
Academic degree	PhD	75	93.8
	Master	4	5
	Bachelor	1	1.3
Field of knowledge	Art and Humanities	22	27.5
	Social and Legal sciences	18	22.5
	Sciences	15	18.8
	Health Sciences	20	25
	Engineering	4	5
	Prefer not to answer	1	1.3
Type of employment contract	Laboratory technician	0	0
	Predoctoral	1	1.3
	Postdoctoral	5	6.3
	Part-time and temporary contract	25	31.3
	Part-time and permanent contract	3	3.8
	Full-time and temporary contract	11	13.8
	Full-time and permanent contract	35	43.8

The majority had a PhD (94%). 27% worked in Arts and Humanities, 25% in Health Sciences, 22% in Social and Legal Sciences, 19% in Sciences and 5% in Engineering[2]. 43% were working full-time on a permanent contract (associate lecturer or full professor). 31% were working part-time

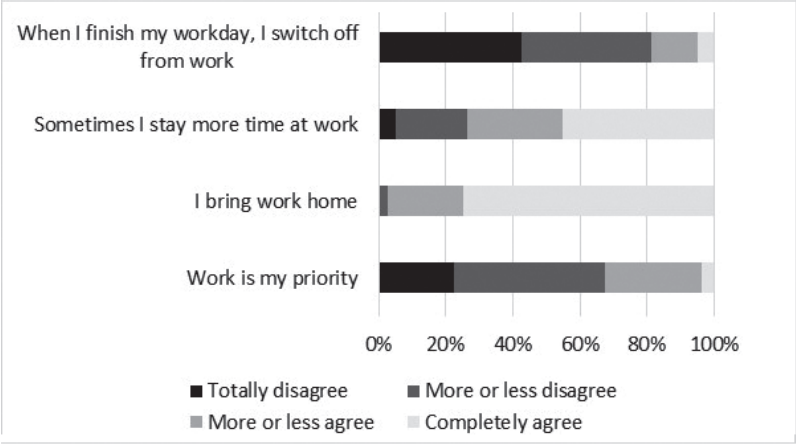
on a temporary contract, most of them associate fellows. 14% had a full-time temporary contract, among them assistant lecturers. The remainder were PhD students (1.3%), postdoctoral fellows (6.3%) and part-time workers with a permanent contract (3.8%).

Experiences relating to the maternity of academics at the University of Murcia indicate that in the first few months of their baby's life, the respondents were mostly accompanied by their partner, husband, family or friends (85%). 4% only had the company of their partner, and 9% were alone. Regarding housework and care of the babies, 51% said that their partner or husband participated, 33% had help from a housekeeper or caregiver, and 11% from their mother or father. Despite this help, 78% would have preferred to receive greater collaboration, especially regarding the organization of chores. They state, for example, that they would have liked "my partner to be a little more involved" (Respondent (R) 43, postdoctoral fellow), "having the family closer so they could participate in childcare" (R16, full-time, permanent position) or "a housekeeper to do the cleaning" (R64, full-time, permanent position). On the other hand, when they returned to work and during their work schedule, 53% of babies attended a nursery school, 20% were reared by grandparents and 16% by a caregiver. 26% of mothers said that they had never missed work because their child was ill, while 49% had missed work on 1 to 6 occasions and 20% on more than 8 occasions.

Practically all the respondents (95%) considered that the duration of the maternity leave is insufficient (16 weeks in Spain), and 99% said they would have liked to have longer leave. 39% think maternity leave should be at least six months. Among fathers, however, just 78% believe that paternity leave should be longer (up to 2019 it stood at 5 weeks).

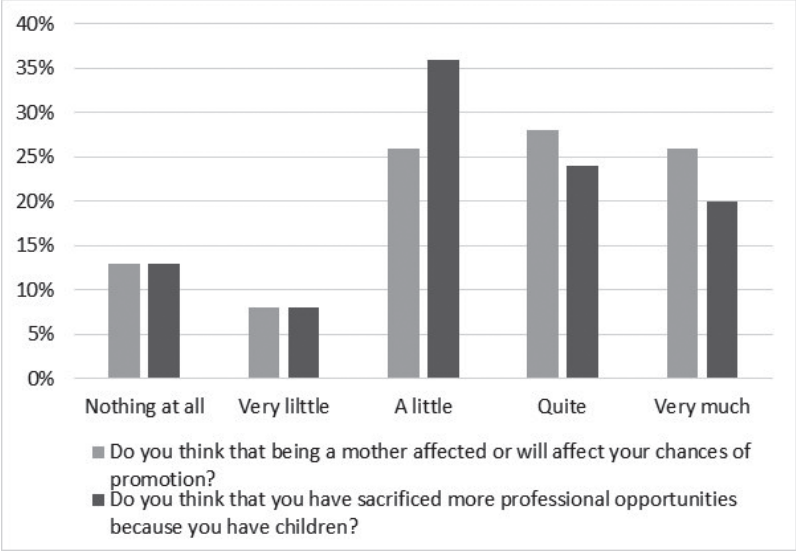
Regarding co-workers' approach to their pregnancy and maternity, the majority of mothers answered that these were well accepted (69 and 70% respectively). When returning to work after maternity leave, 85% were able to continue with their tasks and 15% changed; 5% of whom said that this change was beneficial. On the other hand, 54% said they started to work remotely more frequently. 43% reduced their working hours while 50% continued working the same hours as before. Data show that academics in general have long working hours, and 38% said they work more than 8 hours per day. Figure 2 shows that, even though work is not a priority for them, most of the respondents agree with the statement "I bring work home" (75%) or "I stay more time at work"

Figure 2
Answers related to workday and work choices, in percentages



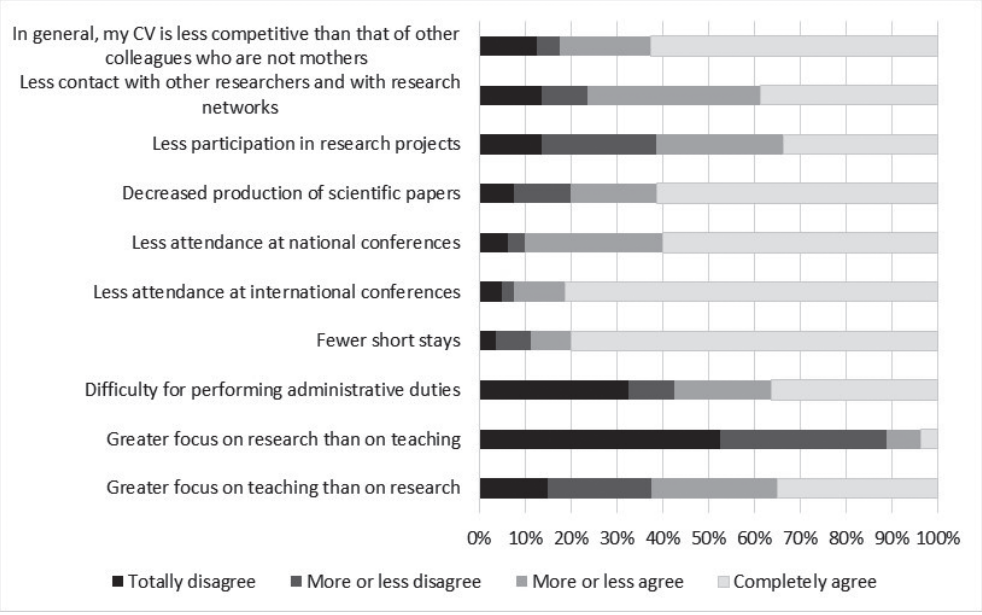
Regarding the influence of motherhood on career promotion, 54% said that it has greatly negatively influenced or will greatly negatively influence their chances of promotion. 44% consider that they have given up professional opportunities because they had children. On the other hand, 13% said that motherhood had not influenced their promotion at all and 21% considered that they had not sacrificed any professional opportunities or only a few (Figure 3).

Figure 3
Answers regarding motherhood and promotion in percentages



The greatest handicaps of motherhood for academics at the University of Murcia (Figure 4) are related to mobility. 80% totally agreed that their motherhood had led to fewer research stays abroad and to fewer international and national conferences (81% and 60% respectively). 28% agreed and 35% totally agreed that they had had to focus more on teaching than on research. Management tasks and participation in research projects had been less affected. 63% of the participants totally agreed that motherhood had implied having a less competitive curriculum than other co-workers who were not mothers; 20% more or less agreed with this statement, 5% disagreed and 13% totally disagreed.

Figure 4
Greatest handicaps found by respondents because of motherhood, in percentages



In spite of the above, 54% are confident that sooner or later they will be promoted to a better position at work, and 65% that it will not be necessary to change their workplace in order to obtain promotion. 50% would not be willing to move, while 20% would be prepared to move to a national and/or European institution and 10% to any foreign country. The remaining 20% acknowledge that they do not know if they would change their place of residence.

Concerning the influence of motherhood on their scientific career and promotion, respondents point out that:

"Motherhood reduces research productivity" (R49, full-time, permanent position); "delays the academic career" (R10, full-time, permanent position); "has meant an encumbrance in my research facet" (R47, full-time, temporary contract); or "taking care of my children means giving up time for research" (R39, part-time, temporary contract). Most of them believe that motherhood has meant leaving research behind and focusing on teaching.

The vast majority admit that "before motherhood, I spent my time increasing my CV. Now I dedicate it to the education and care of my children" (R80, postdoctoral fellow); and "high-level research demands a dedication that is difficult to make compatible with motherhood" (R25, full-time, temporary contract). In this sense, they comment that work-life balance in academia is very difficult and they have had to put some tasks aside.

On the other hand, some academic mothers agree that the work they do is more or less flexible, the workload is high and sometimes self-imposed in order to develop a more competitive curriculum, especially in the research topic, considering that:

"Research work is very flexible and the same professional goals can be achieved although somewhat more slowly than other professionals" (R44, full-time, permanent position); "I feel fortunate as a mother because flexible schedules allow me to take and pick up my child and to share many moments with them. But such flexibility can be a disadvantage because you also have to adapt to a very demanding job that forces you to travel or to teach classes in the afternoons, which are less compatible with maternal responsibilities" (R42, full-time, permanent position).

However, they answer that "I believe the main problem is not the University itself, but the research system at a national level, in which we are required to work many hours in teaching, research and management. Evaluations are very tough. It is not always easy to keep your CV updated while being a mother" (R8, postdoctoral fellow); "To maintain my previous productivity level, I have to make a superhuman effort, which I find exhausting. My research production requires me to sacrifice rest time if I want to keep up with my colleagues without children" (R2, full-time, permanent position); "My male colleagues who joined the university at the same time as I did have already been promoted. My career [with my maternity] has slowed significantly" (R64, full-time, permanent position); "I can handle management and teaching duties, but I barely have any time to do research" (R35, full-time, temporary contract); and "As a mother of two children and regardless of support at home, it is very difficult to do all that is required of teachers and researchers: publish in relevant publications,

apply for research projects, and a long list of activities and tasks related to promotion" (R27, full-time, permanent position). Again, they complain about the difficulty of finding a balance between work and motherhood.

This means that balancing housework and childcare with work is not easy. The answers are especially clear when the survey respondents have more than two children or when there are children with a disability or a rare disease that require much more attention and care. They point out that "I have had to continue proving that maternity leave and having a daughter has not diminished my teaching and research capacity" (R34, part-time, temporary contract); "There is a constant feeling of having had the best experience of life with motherhood and, at the same time, of having 'wasted' that time from the point of view of my professional career" (R78, full-time, temporary contract); or "I didn't take unpaid leave to take care of my children for fear of not being promoted afterwards" (R24, full-time, permanent position).

Academics with two jobs who have a temporary part-time contract with the university, especially those working in the healthcare field, consider that motherhood "is incompatible with holding two jobs" (R56, part-time, temporary contract) and "it seems impossible for me to be promoted to assistant lecturer. I work from 08:00 to 15:00 in a hospital and part of the afternoon I teach. If I want to be with my son, it is impossible for me to devote time to accreditation for a university position. I have given up that possibility" (R73, part-time, permanent position).

Three of the respondents considered that being a mother had not created any more obstacles to their professional career, answering "I have been promoted to a permanent position without issue" (R44, full-time, permanent position); "Motherhood has not held back my professional career. On the contrary, other tasks or positions related to management have arisen. The only things that have changed are my habits. Now I have lunch at the faculty and finish my workday when I pick up my son from the nursery" (R1, full-time, permanent position); and "I defended my PhD after my child was born in four years. Where there's a will there's a way" (R57, part-time, temporary contract).

In the Spanish science system, the state agency ANECA provides external quality assurance for the Higher Education System and evaluates the CVs of applicants for ordinary and civil servant academic positions. With regard to obtaining a positive accreditation from ANECA and, therefore, the possibility of promotion and also assessment of merits for new vacancies, respondents consider that motherhood should be taken into account as women with children do not compete in equal conditions:

"Maternity leave and parenting time for children should be taken into account in the scales and evaluations for new positions at the University, ANECA accreditation, etc." (R6, full-time, permanent position); "A professional break or slowdown in the academic career of new mothers should be taken into account in the evaluation or accreditation processes and in applications for projects." (R12, full-time, permanent position); "The CVs of mothers in academia should be assessed differently since they are not on equal terms with colleagues that are not mothers." (R30, full-time, permanent position); "Maternity leave (and leave of absence) delays the acquisition of points for more stable positions in the future." (R47, full-time, temporary contract).

In this respect, some mothers make suggestions, such as "requests regarding the schedules of academics with dependent children should be addressed, giving priority to the mothers of babies, because in the end they are the ones that bear the weight of the upbringing" (R53, full-time, permanent position); "I think academics that are mothers should have a reduction in the teaching load without a decrease in their salary." (R77, full-time, permanent position); "A research and teaching career requires many hours at times that are often incompatible with family life. Flexible schedules and remote working are essential for combining motherhood with work" (R66, full-time, temporary contract). As can be seen, many of them request to adopt work-life balance measures, as well as to be able to compete on equal terms with their childless peers.

DISCUSSION

Our study outlines several barriers regarding motherhood and work-life balance and academic promotion. Mothers at the University of Murcia call for longer maternity leave and more collaboration in childcare and household chores. Their priority is the family rather than their work, but they still stay at work longer than required and also take work home. They often call for greater flexibility in their working hours in order to "juggle responsibilities", as Ysseldyk et al. (2019) pointed out. As shown in this study, some feel guilty when they are not working, both because there is work left undone, and because they are preoccupied with their work while spending time with their children. This is also shown in the study by Armenti (2004).

In our study, 20% of the respondents felt that their co-workers considered their pregnancy and maternity as "bad" or "not so good". This can be related with different perceptions of being a mother and a worker. Morgenroth and Heilman (2017) showed, for example, that a woman taking

maternity leave was evaluated more negatively in the work domain, while a woman deciding not to take maternity leave was evaluated more negatively in the family domain.

Most of the respondents considered that being a mother implied a less competitive curriculum compared with co-workers that are not mothers, although 18% of them did not agree or totally disagreed with this assumption. Mobility is seen as the main handicap, related to difficulties for attending international and even national conferences, or for doing field work or accepting short stays. The results suggest that women academics that are mothers focus more on teaching than on research. In this context, more than thirty years ago, a study by Cole and Zuckerman (1987) showed that married women with children published no fewer papers than married women without children and that older eminent women with children generally published as much early in their careers as their unmarried counterparts did, accepting that married women scientists with children paid a price to remain scientifically productive. Other authors show that family-related variables, such as having dependent children, have little or no effects on research productivity for full-time men and women teachers (Sax et al., 2002; Aiston & Jung, 2015).

More than half of the respondents considered that motherhood had influenced or will influence their chances of promotion. However, less than half considered that they had sacrificed professional opportunities because of their motherhood and were confident they would obtain promotion without having to move to a different workplace. Mason and Goulden (2002) and Williams (2004) indicate that women who become mothers soon after completing their doctorates are less likely to gain tenure than their male counterparts who become fathers at the same point in their educational pursuits, across disciplines and types of institution. Women who have babies early in their career are more likely than others to form part of the 'bottleneck' problem, i.e. the non-tenured academic second tier (lecturers, etc.). On the other hand, women who have babies later on show a trend that is similar to women who have no children (Mason & Goulden, 2002). Sánchez de Madariaga et al. (2011) show that, with similar backgrounds, a man with children is four times more likely to be promoted to a professor position than a woman with children.

Cole and Zuckerman (1987) showed that many younger American women were delaying motherhood until they received tenure. This assumption of a clear decision to postpone maternity is also made by Ysseldyk et al. (2019) who interview postdoctoral women working in Germany and Canada. It is also found by García de León et al. (2001), who show the differences between female academics with permanent and

non-permanent positions in Spanish public universities, with 70.9% of the former having children vs. 59.2% of the latter. These differences can also be seen in our study as some academics became mothers after gaining a permanent position. 89% had their first child at the age of 30 or over (of which 45% were more than 35 years old, which is above the average age of 32 for new mothers in Spain).

> The factors causing the 'leaky pipeline' phenomenon are not yet fully understood. It is probably a combination of traditional social roles, difficulties for achieving work-life balance, low integration of women in professional academic networks, lower career ambitions among women compared to men, and less self-confidence among women in their own academic capabilities (Hansmann & Schröter, 2018, p.2)

This discrimination can be associated with stereotypes and biased gender-related beliefs (Moss-Racusin et al., 2012; Reuben et al., 2014; Régner et al., 2019). Women's opportunities to rise to leadership positions frequently depend on those controlling selection and admission processes (Sánchez de Madariaga et al., 2011; EIGE, 2016a). For example, Witteman et al. (2019) showed that there is a gender gap in grant funding that is attributable to less favourable assessments of women as principal researchers rather than to the quality of their proposed research. The same statement can be made about the Research and Development funding projects of the Spanish Ministry of Science, Innovation and Universities (Puy Rodríguez, 2018)

Age and time-based restrictions for certain positions may help explain why, in particular, the birth of a child after the doctorate adds to the leaky pipeline (Hansmann & Schröter, 2018). An extension to age restrictions for applications for research projects and grants due to parental leave has been developed in some places. For example, in Spain, the most renowned Ramón y Cajal postdoctoral contracts extend the doctoral degree time limitation by one year per child (both for mothers and fathers). Also, a fixed-term contract in academia is extended by four months per maternity, corresponding to the current length of maternity leave.

STUDY LIMITATIONS

This paper represents the first steps in exploring how maternity can influence the activities and promotion of academics at the University of Murcia in Spain. The study presented here has limitations. The representativeness of the data is limited to the academics at this university who answered the survey. The total sample size of women was adequate for our analyses, but future research should explore: (1) differences between

male and female academics at this university, comparing the views of both of them on promotion, type of work and family issues; (2) taking into account our results in this study, we should move from online self-reporting surveys to interviews in order to find out more about the opinions and feelings of the interviewee; (3) online surveys and interviews should also be conducted in other Spanish universities to search for trends, explanations or stereotypes in the different situations explained by the respondents; (4) not only childcare should be taken into account but also care of the elderly or people with disabilities.

This is a case study and its results should not be generalized as they might not fully represent the views of mothers in academia in other countries or even in Spain.

CONCLUSIONS

At the end of the 1990s, an Opinion published in Nature (1999) stated that every generation of women, including those who are now experienced university teaching staff, believed that gender discrimination was 'resolved' in the previous generation and that it did not affect them. However, little by little they were realizing that the conditions were not equal and that for this reason they had paid a very high price, both personally and professionally.

Many efforts have been made since 2000, with the creation of European and national institutions, and laws. Reports, conferences or initiatives showing that gender differences in science institutions remain or are being reduced very slowly. In more than one third of EU Member States, little is being done to achieve gender equality in research (EIGE, 2016c).

The impact of maternity in academia needs a more detailed analysis, relating motherhood, productivity and academic career and broken down by professional levels and sectors of activity. The relationship between motherhood and abandonment of a scientific career or impediments to advancement in that career should also be studied.

It is not just the costs that mothers have to pay to develop their careers that have to be considered when drawing up actions to promote equal access to scientific careers. Other situations, such as the care of people with disabilities or the elderly, must also be taken into account in a society in which the population is aging and life expectancy is increasing. It is usually women who are in charge of household chores and care. Wolf-Wendel and Ward (2003) stated that policies are needed to integrate work and family life and should be universally applied in an effort to bring men more fully

into the fold of childbirth and childcare so that women are less responsible for the "second shift". Examples of initiatives to reconcile work and family care can be found in Danish universities where a teaching-free semester for researchers returning from parental leave has been introduced, and childcare facilities are provided as well as financial support for research stays abroad. Also in Belgium, where day care is provided for children up to the age of three as well as flexible working hours, remote work, and an ironing service (EIGE, 2016c).

NOTAS

1 These data do not include staff on doctoral or postdoctoral programmes, or those hired by a research project.

2 At the University of Murcia there are 10 degrees in the area of Arts and Humanities, 21 in Social and Legal Sciences, 8 in Natural Sciences, 10 in Health Sciences and 2 in Engineering (https://www.um.es/web/estudios/grados, last accessed 25 August 2019)

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