



Is there a gender gap in Italian radiology? A cross-sectional study



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ABSTRACT

Background: Although the number of women entering the medical profession has increased, this has not led to an even distribution in all branches of medicine. In countries where the health service is mainly private, there are still fewer female radiologists, especially at managerial level. The aim of this paper is to make a comparison of work-related stress, satisfaction and perceived organizational justice in male and female radiologists in Italy.

Methods: Italian radiologists were asked to answer an anonymous questionnaire during two successive national radiology Congresses.

Results: Women reported a psychophysical workload that was the same as that of their male colleagues, but claimed that they had less control over their work, made a greater effort to fulfill job requirements, were more over-committed in their work and received fewer rewards for the work performed than their male colleagues. On account of the lack of procedural, distributive and informative justice, women radiologists perceived the work environment as significantly less fair compared to their male colleagues. Moreover, they derived less satisfaction from their job. They suffered from anxiety, depression and minor psychiatric disorders to a greater extent than their male counterparts.

Conclusion: Despite the significant number of women radiologists in Italy, the gender gap still exists and can be witnessed in horizontal and vertical segregation. Policies should be introduced to contrast gender bias

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1. Introduction

For many thousands of years, the medical profession, like many other well-paid professions, has been a predominantly male territory, although there were a few women doctors in ancient times. Egyptian records show that as early as 1500 BC, women were students at the Medical School of Heliopolis in Egypt, and on the walls of the Tutankhamon's tomb, archeologists have revealed the earliest picture of a woman physician [1]. In Italy, women physicians have always been in the minority, and are still currently fewer in number than men. However, times are changing: in the '60s, women represented only 5% of physicians and a maximum of 10% of medical school enrolments, but now women make up more than 50% of all Italian medical school students [2] and new medical graduates [3].

Has this increase in the number of female doctors occurred without vertical segregation, i.e. do female doctors have the same chance as males of reaching the highest levels of a clinical or academic career? And what about horizontal segregation, i.e. are

women under-represented in some career specialties? Finally, do female doctors have the same level of mental health as their male colleagues?

In this paper we intend to answer these questions by comparing the state of psychological well-being, occupational stress and perceived occupational justice of female radiologists with that of their male colleagues.

2. Population and methods

In recent years in Italy, an increasing number of women have chosen a career as a radiologist. In 2012, male members of the Italian Society of Medical Radiology (SIRM) still outnumbered female radiologists, however, women predominated in the lower age groups, so it is easy to predict that in the future female radiologists will be more numerous than males (Table 1).

During two successive National Congresses of the Italian Society of Medical Radiology (SIRM), held in 2007 and 2008, radiologists were invited to anonymously complete a questionnaire that included, amongst other things, a section for evaluating work-related stress and one for estimating its consequences. The first questionnaire was specifically intended to study malpractice stress [4]; the aim of the second questionnaire was to study violence against radiologists and analyzed the concept of procedural justice

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Table 1
Number of members of the National Scientific Society of Radiology (SIRM) in 2012.

	Total	Male (N, %)	Female (N, %)
Members 2012	9921	5891 (59.4)	4030 (40.6)
Born before 1962	3946	3076 (78.0)	870 (22.0)
Born between 1962 and 1972	1863	1069 (57.4)	794 (42.6)
Born between 1972 and 1982	2887	1230 (42.6)	1657 (57.4)
Born after 1982	1225	516 (42.1)	709 (57.9)

in the workplace [5]. The characteristics of the population studied and the instruments used have been set out in detail in the aforementioned papers. This study merely examined the differences between genders that emerged during the two surveys. The surveys were approved by the Ethics Committee of the Università Cattolica del Sacro Cuore, Rome. 654 responses were obtained for the first questionnaire, while 992 radiologists replied to the second questionnaire.

To measure the perception of work-related stress we used Karasek's demand-control-support (DCS) questionnaire [6] and the effort-reward imbalance (ERI) questionnaire devised by Siegrist [7] in their Italian versions [8]. Karasek's questionnaire provided scores relating to the "demand" scale, i.e. the psycho-physical demands of the job; the "control" scale measured the amount of discretionary power the worker has in performing his work, and the "support" scale indicated support from colleagues and superiors. Job strain can be defined as an elevated psychological workload and low control. Siegrist's questionnaire provided an "effort" scale (the psychological work effort or extrinsic stress), an "over-commitment" scale (high work commitment, or intrinsic stress) and a "reward scale" (rewards received for work performed). The weighted ratio between effort and reward yielded a continuous measurement (effort-reward imbalance, ERI). The reliability of both questionnaires was high, with Cronbach's alpha of 0.60 for demand, 0.56 for control, 0.87 for support, effort, and reward and 0.91 for over-commitment.

The self-perception of organizational justice was measured with Colquitt's questionnaire [9] in its Italian version [10]. This instrument is a direct measure of perceived fairness, which reflects various components of organizational justice (procedural, distributive, interpersonal, informative) [11]. The reliability of the questionnaire was very high, with Cronbach's alpha of 0.92 for the entire questionnaire and values respectively of 0.94 for the relational subscale, 0.88 for distributive justice and 0.79 and 0.63 for the other two scales of procedural justice.

Physical health was self-assessed by means of a single question: "How would you judge your overall health"? Respondents were required to give a graded response from 1 (major problems) to 5 (very good).

Job satisfaction was measured with the Job Satisfaction Scale (JSS) developed by Warr, Cook & Wall [12]. In its original version, the Warr scale consists of 15 questions each with responses on a 7-point Likert scale ranging from 1 = extremely dissatisfied to 7 = extremely satisfied. In research studies on physicians, the scale has been used in a reduced 10-question version, the last question of which asks for an overall assessment (from 1 to 7) of job satisfaction. The overall score derived from the sum of responses ranged from 10 to 70. The reliability of the Italian version of the questionnaire [13], measured with Cronbach's alpha, was high (0.93).

Happiness was measured using the Abdel-Khaled 11-point (0–10) single-item scale [14]. This scale shows good temporal stability (0.86) and excellent correlation with other scales containing more questions.

The consequences of distress were evaluated using the General Health Questionnaire (GHQ12) [15] and Goldberg's anxiety and

depression scales [16], both in their Italian versions [17]. The GHQ, which is probably the psychological malaise indicator most frequently used in the literature, indicates the probability of suffering from short-term psychic disorders. It is made up of 12 questions, each of which has four possible answers. We used the correction method based on a Likert scale from 1 to 4 to create a variable between 12 and 48. In this study, GHQ12 reliability was high ($\alpha = 0.90$).

Goldberg's A/D questionnaire, which was originally designed to help General Practitioners diagnose a psychiatric disorder, is made up of two scales of 9 binary (no/yes) questions. The total number of affirmative answers constitutes the final score. In the current study, Cronbach's alpha (reliability) for the questionnaire was 0.82 for the anxiety scale and 0.79 for depression.

Data were analyzed with the IBM/SPSS 20.0 software package. The distribution of each psychosocial variable was initially studied with the common statistical parameters (mean, standard deviation). Comparison between mean scores of each variable in male and female radiographers was made by the Mann-Whitney *U* test.

3. Results

Out of a total of 654 respondents to the first questionnaire, 456 (69.7%) were male and 198 (30.3%) female. Average values of the work-related stress variables are shown in Table 2. Gender comparison indicated that women had the same workload as men (Demand) and the same level of social support (Support), but less job control ($p < 0.05$). Women felt that they had to make a greater work effort than men ($p < 0.05$) and received much less recognition for the work done ($p < 0.001$). Compared to males, females tended to have a greater emotional involvement in their work, or over-commitment ($p < 0.001$), and had a lower level of job satisfaction ($p < 0.001$). Levels of anxiety, depression and psychological problems were higher in females than in males ($p < 0.001$).

Of the 992 respondents to the second questionnaire, 610 were males (61.5%) and 382 females (38.5%). The scores of the variables relating to physical health, happiness and the perception of organizational justice are reported in Table 3. All subjects had the same average level of physical health and happiness, irrespective of gender, whereas females had a significantly lower level of perceived justice than males ($p < 0.001$). In particular, they reported less procedural distributive and informative justice than their male colleagues ($p < 0.001$). Interpersonal justice was the same for both genders.

4. Discussion

Our study indicates that in Italy the working conditions of female radiologists are still different from those of their male colleagues. Although the physical and mental workload is similar in the two genders, females have less control over work than their male colleagues, make a greater effort to meet their work demands and have a greater emotional involvement (intrinsic stress), but receive less tangible and intangible rewards for their work.

The satisfaction that female radiologists derive from work is lower than that of males, and they perceive a lower level of procedural justice related to their work situation (type of activities, resources and tools provided, workload, objectives, remuneration, career etc.) and a lower distributive fairness in work, compared to males. Women complain of a lower level of informative justice i.e. compared to males, they report more frequently that their superiors tend not to be sufficiently sincere, reasonable and transparent as regards work communications.

No differences between males and females were found with regard to social support and interpersonal justice, nor to levels

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