

Gender and Ergonomics: The Recognition of Women's Occupational Diseases

Silvana Salerno

Division of Biomedicine
ENEA Italian National Agency for New Technologies
Energy and Sustainable Economic Development
00123 Rome, Italy

ABSTRACT

Scientific international papers have been selected to show the underrepresentation of women's occupational diseases in many countries. Women musculoskeletal disorders are included although represent the first claims of working women not only in Europe. Lack of ergonomics in gender work concept is the cause of women occupational illnesses but more ergonomics should also play a role in ameliorating the gender gap recognition. Job title and summary description of work activities are not fair in representing women's exposure. Dual task (or double actions) and multitasking are examples of poorly studied women's work activities. Only some specific studies in the health care sector show multitasking work demand towards higher performance among nurses. The increase in fatigue towards occupational diseases, due also to this exposure, represent another ergonomics challenge. Ergonomic observation of women work can help to identify inequities in each step of the process to overcome gender bias, occupational health diseases included.

Keywords: gender, ergonomics, occupational diseases, dual task, multitasking, compensation claims

INTRODUCTION

Karen Messing denounced ergonomics gender gap in the recognition of women occupational diseases, recommending to examine whether and why the rate of approval of compensation claims differs between women and men for the same type of work-related injury or disease. Review of workers's compensation schemes from a gender point of view was also suggested (Karen Messing, 2006). Ergonomic analysis of work activities can play a determinant role towards equity in the recognition of occupational diseases as well as their compensation, as shown in a swiss case trial to recognize epicondylitis (Probst I, 2013) and in an italian trial to recognize a right finger hand problem in a hospital female surgeon (Sacco A., 2009). Female dentists showed also a symptomatic hand osteoarthritis with increased risk of low pinch grip strength in both hands higher for the right hand (Ding H., 2010). The overcome of gender bias, in each step of ergonomic intervention, can prevent the burden of the unhealthy effects due to the increase of rhythm, monotony, repetitiveness that working women are now encountering. Ergonomic work analysis can also play a role in discovering new sources of overload in work demands such as double actions (dual-task, multitasking) so frequent and underreported in women work activities. The nurses exposure to double actions (dual-task) supporting patients (mental load) while performing their physical care was ascertained in a case study using the method of organizational congruences that is an ergonomic analysis of work (Salerno S., 2013).

In Italy (years 2007-2011) only thirty per cent of women occupational diseases had been recognized although a

recent amelioration of Italian compensation work system for women musculoskeletal occupational diseases was approved in 2008. The new Italian occupational diseases list improved the rate of recognition of women carpal tunnel syndrome (CTS) because it was included in the list. Burnout has not been included as a specific occupational disease in the list and therefore it is still underdeclared together with other mental/cognitive occupational diseases (such as depression, violence and others) that are waiting for a visible improvement in terms of declarations and success rate.

An ergonomic approach has to be improved again in order to recovering the capability of observing working conditions, taking gender and other inequalities (age, immigration) into account, in order to implement the discussion on the contrast of performance and well-being (Nathanael D, 2012) particularly when gender is considered.

Papers scientific results discussing how ergonomics can improve the rate of women's recognition (and prevention) in ergonomics aspects of work are shown. Particularly main literature concerning women's experience in workers' compensation system, focused on musculo-skeletal disorders, and exposure to new (old) risks such as dual-task, multitasking, interruptions.

WOMEN'S EXPERIENCE IN WORKERS' COMPENSATION SYSTEM

According to the International Labour Organization (ILO, 2005) two millions men and women die from work-related injuries and diseases. Underestimation of women's data was confirmed. Women's paid work is generally regarded as safe, "light" and women's occupational injuries and illnesses are underdiagnosed (Messing, 2006). Women's claims for compensation were mainly refused (Swedish National Board of Occupational Safety and Health, 1998) even in Sweden. Swedish data on compensation approvals showed the assessment of work-related diseases (Tab.1). Greater inequities were also been assessed for musculoskeletal disorders' claims with only 21 % approved for women compared to 38 % for men.

Source: Swedish National Board of Occupational Safety and Health, 1998 (in Messing, 2006)

Table 1 - Sweden - Reported work-related diseases that have been assessed by the social insurance office 1994-1997

Assessment of case	Approved	%	Not approved	%	Total
women	278	22.8 %	941	77.2 %	1219
men	658	43.6 %	852	56.4 %	1510

Quebec women's experience on compensation claims [Lippel K., 2003] confirms how women workers are significantly less likely than their male counterparts to have their occupational disease claims accepted by the appeal tribunal. Kippel results in tab. 2 show the gender success rate for tendonitis (50 vs 54%), epycondilitis (21 vs 37 %) carpal tunnel syndrome (CTS) (24 vs 40 %). The author underlines the role of ergonomist in recognizing the exposure: "Those claims that were accepted were often supported by the testimony of several specialists who backed up their testimony with epidemiological studies specific to the type of work done by the worker, as well as by ergonomists testifying as to the specific flaws in the workstation. Given that, in Quebec, no economic support is provided to workers who want to bring an appeal to the tribunal, the cost of the increased evidentiary burden, coupled with the radical reduction in success rates, has undoubtedly discouraged many workers from pursuing claims.". Winkel and Mathiassen, cited by Lippel K., discussed (Winkel, 1994), underlined that traditional study model in epidemiology presents serious reliability problems when applied to musculoskeletal disorders. In many studies, the nature of exposure is described by *job title*, but there is extreme variation in task that might be grouped under the same job title and extreme variation in the way individual workers interact with their workstation, due to differences in the morphology and physiology of workers. The authors conclude that "*risk estimates in terms of job title offer no practicable basis for ergonomic interventions.*" This is particularly true if we consider gender, age and women's working activities.

Australian women’s experience in the workers’ compensation system suggests that women often receive less than men compensation payments. These results are mainly due to the combination of lesser bargaining power, lower wages. Women have different forms of injury and disease together with lack of equity in dispute resolution process (Guthrie R, 2006). This is particularly true when immigrant women are involved. Asian immigrant garment workers exposed to highly repetitious work did not file for workers' compensation claims because of lack of knowledge and fear of reprisal (Burgel BJ, 2004).

Source: Lipple K. (2002)

Tab. 2 – Quebec - Gender and success rate (CALP- cases, 1987–1996) (N = 232)

	Tendonitis	Epicondylitis	CTS Total	Total
Female	50% (21/42)	21% (9/43)	24% (10/42)	32% (40/127)
Male	59% (17/29)	37% (15/41)	40% (14/35)	44% (46/105)
Total	54% (38/71)	29% (24/84)	31% (24/77)	37% (86/232)

*Fisher’s exact test two-sided P

CALP: Commission d' appel en matière de lésions professionnelles

An under-recognition of women occupational diseases for MSDs in Switzerland has also been found with a low gender rate (Probst, 2009). In tab. 3 update data on the phenomenon in Switzerland shows the same gap (40 vs 64 %). In Italy (tab. 4) low gender rate was also shown for tendonitis, intervertebral discs, muscles, ligaments, aponeurosis, soft tissues in industries and services settings when analysing the published national statistical data (Probst I, 2013).

Source: Probst I. (2013).

Tab. 3 – Switzerland MSDs cases declared and accepted in Switzerland (medium 2007-2011)

	Declared	Accepted	Success rate %
Male	575	366	64 %
Female	181	72	40 % *
Total	756	438	58 %
Women quote	24 %	16 %	

*p<0.001

Source: Probst I. (2013).

Tab. 4 - Italy- MSDs cases declared and accepted in the industries and services (medium 2009-2011)

	Declared	Accepted	Success rate %
Intervertebral discs			
Male	5176	2207	43%
Female	1772	523	29.5 % *
Tendonitis, synovitis, bursitis			
Male	3816	2110	55 %*
Female	3023	1561	52 %
Muscles, ligaments, aponeurosis, soft tissues			
Male	4425	2451	55.5 %
Female	1839	1047	57%

<https://openaccess.cmc-conferences.org/#/publications/book/978-1-4951-2108-1>

* $p < 0.001$

Carpal Tunnel Syndrome (CTS) is the most frequent entrapment neuropathy in Italy with a steady increase (Italian crude incidence rate was 227 per 100,000 women and 54 per 100,000 men). The first hospitalization was high and varied widely by geographic area. The number of new cases in the Italian region Piedmont was estimated 1,500 higher than compensation claims related to CTS [Bena A. et al. 2007]. The authors underline how health education campaigns addressed to general practitioner on compensation law could improve reporting to the workers' compensation board. Carpal tunnel syndrome (CTS), after its insert in the list of occupational diseases list, seems to be more equally recognized (2010-2011= 74.5 women vs 74 % men) in the industries and services (Probst, 2013). The new Italian list of occupational diseases since 2008 has improved the recognition of 2253 women carpal tunnel syndrome (2010-2011) due to the effect of its inclusion.

In the United States of America *knee work related disorders* were identified using the Wahington State fund worker's compensation data from 1999-2007 [Spector et al. 2011]. They represented 7% of musculo skeletal disorders (MSDs). Occupations among women were nursing aides and housekeepers, carpenters and truck drivers among men. MSDs represented the most common occupational injuries and illnesses among health care workers. Workers' compensation claims during 2003-2009 in a large US health care system were studied (Kim et al. 2012). Seventy-six per cent were MSDs about half were due to patient handling, women 50-59 years of age, evening shift workers and be a union member were associated with MDSs. Authors conclude that "*patient handling involves numerous work elements and dynamic physical activities. Understanding the work elements of patient handling and conducting intervention on specific patient handling tasks can reduce MDSs*".

The reported case studies show clearly the low access to compensation affecting working women in numerous countries. Authors of these studies underline the important role of ergonomic interventions in order to perform an analysis of work activities beyond the job title in order to better understand the work elements concerning women exposure and ameliorate the rate of declaration and compensation. Workplace sex segregation, both formal and informal, differences in working conditions in quality and quantity reveal how job title or occupation, have often been used to categorize ergonomic exposure, represent an imprecise measure of exposure because gender is not an independent risk factor (Punnett L., 2000).

Latency of effect of musculoskeletal disorders (MSDs) may also represent another under estimate gender difference. A study (Nicoletti S., 2008) found shorter latency times for wrist/hand tendonitis (mean latency time 5.4 years) and longer latency be related to other MSDs. Authors suggest a cut-off limit to assess a causal relationship between tendon or canalicular work musculo skeletal disorders (a latency period of 12 years). In Germany MSDs were listed only in July 2009 (Giersiepen K, 2011) and workers since then had to prove their occupational origin as it is still in Switzerland. Possible gender differences concerning latency in occupational diseases should also be improved.

GENDER MULTITASKING AS A SOURCE OF EXPOSURE

Dual tasks, multitasking

Demand of multiple activities have become increasingly prevalent especially for women in both their paid and unpaid work hours. Gender related differences in multitasking have been poorly studied (Mantyla T. 2013). A case study on the 'non-formal' work of women nurses, measuring the burden of providing psychological support to patients found that this is often done while nurses are performing tasks of physical care for the patients (double actions) and exposure show differences in hospital wards (Fig. 1).

Women often provide dual-tasking that they usually perform unconsciously. Ergonomics literature on 'multitasking work' and its impact on women's occupational health is scarce. The 'double actions' studied in nurses case study may also be relevant to the 'dual-task' paradigm studied among individuals performing two tasks simultaneously (Kalsbeek 1971, Collet et al. 2010). Charron and Koechlin (2010) recorded brain activity of the two hemispheres, among 16 male and 16 female healthy right-handed participants, while performing dual tasks. The left hemisphere was mainly occupied in the main first task while the right in the second task. The tasks consisted of playing games. <https://openaccess.cms-conferences.org/#/publications/book/978-1-4951-2108-1>

The ‘double task’ was not always compatible with the success of the performance, resulting in a reduction of efficiency and efficacy. Another recent study (Lisman J., 2012) suggests that multitasking is due to a dual system related to conscious and unconscious dimensions. In order to perform dual tasks: the more difficult task would be performed by the conscious system while the secondary one by the unconscious. This result might be of interest in the case-study, in the sense that nurses were expected to provide physical care as their primary duty and supporting the patient’s emotions as a ‘natural’ (unconscious) secondary activity.

Task switching and multitasking have also been studied (Walter SR., 2013) to clear the work priority strategies between nurses (n.104) and doctors (n. 97). *Multitasking* rates were higher in nurses (17.3 vs 9.2 doctors per hour). Health care workers in all settings appeared to prioritize certain types of tasks over others such as arrival of direct care tasks, treated with high priority. *Task-switching* (pausing a task to handle incoming task) was higher among doctors of the emergency department (6.0 per hour). Authors underline the importance of their result to “*optimizing competing quality and efficiency*”. Another study (Berg, 2012) confirm that Registered nurses performed most activities in the emergency department and their activities were multitasked more than the other clinicians. Information exchange was also the most common activity to be multitasked. Unhealthy consequences of the exposure to multitasking and task-switching have not be considered.

Another study (Steege LM, 2013), evaluating physically and mentally fatiguing tasks and sources of fatigue reported by registered nurses, have shown that time and multitasking demands (together with work content demand) are the most frequently identified factors contributing to fatigue. Strategies to reduce fatigue among Registered Nurses have to be developed. The psychological/physical work load of women nurses through double actions (dual-tasks) shows how the ergonomic point of view is very important to understand the real workload.

DIRECT CARE ACTIONS	ONCO HAEMATOLOGY	DOUBLE ACTIONS	EMERGENCY ROOM	DOUBLE ACTIONS	GENERAL MEDICINE	DOUBLE ACTIONS
Changing of linen	3	3			8	1
Bathing patients	1	1	1	1	24	5
Measuring vital parameters	17	4	9		9	1
Preparing and administering drugs	34	16	9		25	7
Asking patient's symptoms (triage)			46	3		
Taking blood samples	3	3	9		11	8
Medication of wounds					4	1
Information to patients	5	1	12	1	1	1
Patient's call					4	4
Cutting patient's hair	1	1				
TOTAL	64	29	86	5	86	28
DOUBLE ACTIONS SUPPORTING PATIENTS		45 %		6%		26 %

Figure 1. Hospital three hospital units Nurses Double actions in supporting the patients while performing physical care (N. 62/236) (Adapted from Salerno S., 2012)

CONCLUSION

More ergonomic approach is needed to improve capability of recognize gender differences in working exposure. This capability can help the virtuous circle increasing reporting and approving women’s occupational diseases. The study of women’s exposure to dual tasks-multitasking can also increase the discovery of new occupational illnesses and their etiology related to both physical and mental demand. Multitasking demand towards higher performance is increasing especially among women in the healthcare. Ergonomics should then increase the capability to overcome inequalities in women’s compensation and in women’s exposure.

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