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Disability among female garment workers

A comparison with a national sample

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BRISSON C, VINET A, VÉZINA M. Disability among female garment workers: a comparison with a national sample. *Scand J Work Environ Health* 1989;15:323-328. An indicator of permanent disability was used to measure the chronic health problems associated with garment work. The study population comprised 800 female sewing-machine operators employed in the Quebec garment industry between 1976 and 1985. The workers were identified from public agency records. Their disability status was obtained in a personal interview. The disability prevalence of these workers was compared to national disability data of women employed in clerical work, services, and manufacturing industries. The garment workers who had left employment had an increased prevalence of severe disability (in comparison with that of workers who had left other types of employment) and an increased prevalence of moderate and slight disability. Currently employed garment workers had an increased prevalence of moderate and slight disability when compared with workers currently employed in other occupations. The risk ratios remained similarly elevated when the data were adjusted for age and smoking status.

Key terms: chronic disease, clothing industry, occupation, textile industry, women.

Women constitute 90 % of the work force in the Quebec garment industry and are mainly employed as sewing-machine operators (1). The industry currently employs about 10 000 factory workers (1), and there is a similar number of home workers (2).

Little is known about the health consequences of working as a sewing-machine operator, but musculoskeletal complaints and anxiety symptoms have been reported (3-7). Even though the tasks of these workers involve repetitive motions, ergonomic studies (5) have shown that they cannot be performed automatically, as has often been suggested for assembly lines or other repetitive jobs. They require a high level of mental activity coupled with a high level of visual attention and accuracy of motion, with constant coordination between the eyes, hands, and feet. In addition, these jobs often involve a high level of time pressure, which has generally been considered an important cause of anxiety symptoms and musculoskeletal complaints (4-7) among workers.

Because previous studies included only active workers, they did not assess the more severe effects which would lead to termination of employment. The pur-

pose of the present study was to determine if garment workers, and particularly those who leave employment, have an increased risk of chronic health problems when compared with women employed in other industries.

Subjects and methods

The garment worker population included all the women who were employed in unionized factories in Quebec between 1976 and 1985 and who satisfied the following criteria: (i) age 45-70 years in 1985 (time of interview), (ii) sewing-machine operator for at least five consecutive years (at least 1000 workhours each year), (iii) Canadian-born and French-speaking, and (iv) resident of the Montreal metropolitan area at the time of the interview.

We used the first and second criteria to select a group of workers whose health problems were more likely to reflect the long-term effect of the work characteristics rather than short-term alterations in health status. Immigrant workers were excluded to improve the comparability of the groups. The study was restricted to the Montreal metropolitan area because 90 % of the garment factories in Quebec are located there.

The cohort was identified from lists of garment workers supplied by the Comité Paritaire du Vêtement pour Dames (Women's Garment Joint Committee). All employers operating in the women's garment industry are required to provide this agency with monthly information regarding the wages and workhours of their employees.

The garment workers were compared with a subgroup of the Canadian Health Survey, conducted in 1980 (8). The subgroup was selected to have charac-

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teristics similar to those of the garment workers under study. Thus it was composed of women who were 45–70 years of age, had 12 or less years of schooling, were born in Canada, were French- or English-speaking, and were currently employed or had been employed in the last five years preceding the interview in clerical work, services, or manufacturing. The education and occupation criteria were used to minimize confounding by socioeconomic status. This selected subgroup could not be restricted to French-speaking women because the numbers available were too small.

For the determination of the differences in chronic health among the two groups of subjects an indicator of permanent disability was chosen. Disability was defined as the presence of one or more disabling conditions for at least 12 months. This indicator was divided into four categories according to the individual's ability to function. These categories were (i) no restriction of activity (no disability), (ii) slight restriction of activities such as hobbies, civic projects, church work, or club work, (iii) moderate restriction of the amount or kind of main activity, ie, working at a job or doing housework, and (iv) severe restriction (unable to carry on main activity).

We attempted to collect data on the garment workers in 1985 in a manner comparable to the Canadian Health Survey. In both groups data regarding disability status, smoking, and sociodemographic characteristics were collected in an interview with the same questionnaire and techniques. The interviews were conducted at home by an interviewer trained according to a standard protocol (9). In both groups reported health problems or diseases which caused disability were coded according to the International Classification of Diseases, ninth revision (ICD) (10). These health problems were

grouped into the following three categories: (i) musculoskeletal diseases (ICD 710–739), (ii) cardiovascular diseases (ICD 400–459), and (iii) other diseases combined.

The analysis controlled for age, smoking status, and employment status (currently employed versus having left employment). In both groups the "having left employment" category was comprised of those who had not worked for the majority of the 12-month period prior to the interview. For comparisons which involved workers who had left employment, the group of garment workers was restricted to those who had left work during the five years prior to the interview. This restriction ensured similarity in respect to time since last employment among the two groups compared (the Canadian Health Survey subgroup was those who left employment during the last five years preceding the interview). Risk ratios were used as the measure of effect (11). Adjusted risk ratios were computed according to the Mantel-Haenszel method (12), and confidence intervals were computed with Miettinen's approximation method (13). All the analyses were performed with the statistical analysis system (14).

Results

Table 1 shows the population base, eligible population, and response rate of the garment workers. A total of 79.5 % of the eligible population was interviewed. Approximately 50 % of the obtained addresses proved to be incorrect, and applications were made to several public agencies in an attempt to locate the workers. The final untraced percentage was 10.0 %, and the refusal rate was 10.5 %. The refusals may be partially explained by the fact that the study population was composed of women, many of whom were retired and living alone and who worried about admitting strangers to their homes. In addition, the tracing was complicated by the fact that women changed their names when they married.

The interviewed garment workers thus comprised 800 sewing-machine operators between the ages of 45 and 70 years. Approximately 45 % of the workers were between the ages of 55 and 64 years. Women with an education of 12 years or less comprised 95 % of the study population, and nearly 66 % of the women had left employment at the time of the interview. Of the workers with disabilities, 90.4 % of the conditions had been present for more than 12 months. This proportion is similar to that found for the general population in previous studies (8, 15). As is standard practice with this indicator (8, 15), all disabilities were considered permanent.

The prevalence of disability among the garment workers is presented in table 2 by age and employment status. By definition, severe disability (a condition which prevented employment or the conduct of house-

Table 1. Characteristics of the garment worker population.

	Number
Workers aged 45–70 years, French Canadians living in the Montreal metropolitan area	3869
Workers with ≥5 years' experience as a sewing-machine operator	1072
Exclusions	
Deceased	58
Deaf	6
Institutionalized	2
Total	66
Eligible population	1006
Not interviewed	
Refused	105
Untraced	91
Absent	10
Total	206
Interviewed	
Currently employed	267
Left work ≤5 years ago	427
Left work 6–10 years ago	106
Total	800 (79.5 %)

work) was exclusively applicable to workers who had left employment. Among these workers the prevalence of severe disability was highest in the 55- to 64-year age group (24.6 %) as compared to 18.5 % for the 45- to 54-year age group. The prevalence was lowest among the workers between 65 and 70 years of age (13.9 %). Moderate disabilities were very common. Among the inactive workers moderate disabilities increased with age. Among the active workers, all the age groups were equally affected.

Former garment workers had an increased prevalence of severe disability compared with workers formerly employed in other occupations (table 3). The age-adjusted risk ratio was 5.0. This increased prevalence of severe disability was larger in the younger age groups. The former garment workers also had an increased prevalence of moderate and slight disability (age-adjusted risk ratio 1.3). Currently employed garment workers had an increased prevalence of moderate and slight disability compared with workers cur-

Table 2. Disability of the garment workers by age and employment status. (95 % CI = 95 % confidence interval)

Employment status	Total	Disability								
		Slight			Moderate			Severe		
		N	%	95 % CI ^a	N	%	95 % CI ^a	N	%	95 % CI ^a
Employed										
45- to 54-year-olds	141	11	7.8	3.4—12.2	22	15.6	9.6—21.6	·	·	·
55- to 64-year-olds	123	10	8.1	3.1—12.9	22	17.9	11.1—24.7	·	·	·
65- to 70-year-olds	3	—	0.0	·	—	0.0	·	·	·	·
Left employment										
45- to 54-year-olds	81	3	3.7	0.0—7.8	14	17.3	9.1—25.5	15	18.5	10.0—27.0
55- to 64-year-olds	244	8	3.3	1.1—5.6	54	22.1	16.9—27.3	60	24.6	19.2—30.0
65- to 70-year-olds	208	6	2.9	0.6—5.2	81	38.9	32.3—45.5	29	13.9	9.2—18.6
Total	800	38	4.7	3.2—6.2	193	24.1	21.3—27.1	104	13.0	10.7—15.3

^a The confidence interval was obtained as follows: $p + Z_{\alpha/2} \cdot \text{Se}(p)$, where $\text{SE}(p) = \sqrt{(pq)/n}$.

Table 3. Disability among the garment workers in comparison to that of women employed in other occupations stratified by age. (95 % CI = 95 % confidence interval)

Employment status	Number of workers with no disability	Moderate or slight disability			Severe disability		
		Number of workers	Risk ratio	95 % CI	Number of workers	Risk ratio	95 % CI
Employed							
45- to 54-year-olds							
Garment workers	108	33	1.8	1.1—2.7	·	·	·
Workers in other occupations	223	34	·	·	·	·	·
55- to 64-year-olds							
Garment workers	91	32	1.7	1.0—2.8	·	·	·
Workers in other occupations	117	21	·	·	·	·	·
Total ^b							
Garment workers	199	65	1.7	1.3—2.4	·	·	·
Workers in other occupations	340	55	·	·	·	·	·
Left employment ^a							
45- to 54-year-olds							
Garment workers	44	15	1.3	0.8—2.1	15	9.7	4.1—22.9
Workers in other occupations	261	66	·	·	7	·	·
55- to 64-year-olds							
Garment workers	109	52	1.3	1.0—1.8	47	4.9	2.8—8.7
Workers in other occupations	218	72	·	·	14	·	·
65- to 70-year-olds							
Garment workers	70	54	1.3	1.0—1.7	21	3.5	1.7—7.1
Workers in other occupations	171	84	·	·	11	·	·
Total ^b							
Garment workers	223	121	1.3	1.1—1.6	83	5.0	3.5—7.0
Workers in other occupations	650	222	·	·	32	·	·

^a Quit during the five years preceding the interview.

^b Age-adjusted risk ratios.

Table 4. Severe disability due to specific causes among the garment workers in comparison to that among women employed in other occupations. (95 % CI = 95 % confidence interval)

Causes	Total number of workers	Severe		Risk ratio ^a	95 % CI
		N	%		
Musculoskeletal diseases					
Garment workers	427	26	6.1	6.9	3.1—15.1
Workers in other occupations	904	8	0.9		
Cardiovascular diseases					
Garment workers	427	16	3.7	4.8	2.0—11.7
Workers in other occupations	904	7	0.8		
Other diseases combined					
Garment workers ^b	427	39	9.1	4.9	2.8—8.5
Workers in other occupations	904	17	1.9		

^a Free of confounding by age.

^b Two cases had an unknown cause.

rently employed in other occupations; the age-adjusted risk ratio was 1.7. The risk ratios for all these associations remained similarly elevated when data were stratified according to smoking status.

Analysis by cause of disability indicated that the association found for severe disability was present for all major categories of disabilities. The risk ratio for disability due to musculoskeletal disorders was 6.9, that for disability due to cardiovascular disorders was 4.8, and that for disability due to other causes combined was 4.9 (table 4).

Discussion

This study found an increased prevalence of disability among female garment workers as compared with women employed in other occupations. The prevalence was particularly elevated for severe disability, and all major categories of disability were involved. These findings indicate that short-term and nondisabling conditions identified by previous authors may have more significant long-term sequelae than had been previously documented.

For the determination of the differences in chronic health problems among the two groups of subjects, we chose an indicator of permanent disability. Disability indicators measure morbidity states, and more specifically, the consequences of morbidity states in terms of the individual's ability to function. They generally include measures of physical mobility, physical independence in basic actions, and the ability to carry on one's usual activities (16, 17). We chose a disability indicator based on one's ability to perform usual activities because it encompasses both the highly disabling physical states and the less disabling physical and mental health problems. This indicator also had the advantage of having been used in the Canadian Health Survey (8); thus comparison with national data was possible.

The chosen disability indicator has had useful applications both as a single measure (18, 19) and as a

component of an index of life expectancy free of disability (15, 20, 21). The latter-mentioned index combines mortality and disability data and is expressed as the average number of years a cohort may hope to live without disability. Its use has highlighted the importance of musculoskeletal problems which are not reflected in mortality indices (20, 21).

The indicator of disability was a self-reported one. Conceptual and operational limitations related to this indicator have been discussed by Sullivan (22). One possible source of bias was that our interviews were conducted directly with the workers, while in the Canadian Health Survey interviews were conducted with one member of the household, who provided information regarding other household members. Thus, in some instances, the disability status of the subjects selected from the national sample was assessed from an interview with a household member. This method of data collection could have led to an underestimation of the real prevalence of moderate and slight disability in the Canadian Health Survey. However, it is reasonable to assume that the reporting of severe disability was not markedly affected. It also seems unlikely that sociocultural differences would affect the reporting of severe disability.

Another limitation of the study is that the prevalence of severe disability, as defined in this study, may have been influenced by the availability of pension and other supports for illness. Indeed, subjects may be more likely to stop work or the conduct of housework because of a health problem if they have access to these services. However, in both of the groups compared, the availability of both types of public pensions (regular retirement pensions and disability pensions) was similar (23). Access to medical care should also have been similar in both groups since hospitalization, treatment, and visits to physicians are universally insured for Canadian citizens.

Another potential problem is that this study compared data collected at two different time periods. The garment workers were interviewed in 1985, while the

Canadian Survey interviews were conducted in 1980. However, the interview procedure and operational definitions of disability were identical. In addition factors possibly related to the reporting of severe disability, such as the availability of a regular pension, a disability pension, and medical care, were similar in both populations over that time period.

Admission criteria were slightly different for the two populations. The garment workers had been employed five years or more in garment work. The Canadian Survey subgroup may have been employed for shorter periods since the criterion was employment anytime between 1976 and 1980. The healthy worker effect is known to be stronger as length of employment increases (24). Thus, if anything, this difference would underestimate the true effect.

Finally, the prevalence of severe disability may be influenced by the requirements of jobs available. An illness which prevents work in certain types of jobs may not prevent work in jobs that are less physically or psychologically demanding. In that sense, the severe disability indicator measures a morbidity level which is relative to the requirements of jobs available. In Quebec the level of unemployment for women in the relevant age groups was similar to that in other areas of Canada (25). Thus the number of jobs available to both groups, and presumably their variety, tended to be similar. However, female garment workers in these age groups may not be able to switch to new types of work so readily as other women. Therefore, we cannot conclude that the requirements of jobs available were similar in both groups compared. For this reason the effect measures presented in this report may not represent differences in "absolute" health status. They may, to some extent, be conditioned by the requirements of jobs.

The observed prevalence of severe disability was lowest in the oldest age group. This phenomenon may reflect early mortality among persons with severe disability. Alternatively, it may reflect the limitation of the indicator. Regardless of their health status, individuals 65 years of age or older do not consider themselves as part of the work force because the Quebec standard public retirement pension is provided at this age (23). Thus the main activity at this age is generally household work. A chronic condition which prevents a woman from gaining employment may not prevent her from carrying out household activities. Thus it is not appropriate to use this indicator to compare the prevalence of severe disability of women aged 45–64 years to that of women aged 65–70 years. However, this limitation of the disability indicator should not affect our comparison with other female workers since age-specific and age-adjusted analyses were presented.

This study was the first to examine the chronic health problems of garment workers. Therefore, the results cannot be directly compared to previous findings. Given the limitations due to possible differences in the requirements of jobs, these results should be inter-

preted with caution. However, our results are compatible with findings of previous cross-sectional studies which showed a high frequency of musculoskeletal and psychological symptoms among garment workers (3–7). The present results are also consistent with the internal analysis performed within the group of garment workers. This analysis found specific work conditions, particularly duration of employment in piecework, to be associated with an increased prevalence of severe disability. This finding is presented in a second paper (26).

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