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A gender approach to work ability and its relationship to professional and domestic work hours among nursing personnel

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Abstract

The association between working hours and work ability was examined in a cross sectional study of male (N=156) and female (N=1092) nurses in three public hospitals. Working hours were considered in terms of their professional and domestic hours per week and their combined impact; total work load. Logistic regression analysis showed a significant association between total work load and inadequate work ability index (WAI) for females only. Females reported a higher proportion of inadequate WAI, fewer professional work hours but longer domestic work hours. There were no significant differences in total work load by gender. The combination of professional and domestic work hours in females seemed to best explain their lower work ability. The findings suggest that investigations into female well-being need to consider their total work load. Our male sample may have lacked sufficient power to detect a relationship between working hours and work ability.

Keywords

paid work; unpaid work; long work hours; work load; work ability; women's work

1. Introduction

“Work ability” is a complex construct reflecting the individual and occupational factors influencing a person's ability to cope in working life (Ilmarinen, 1999). It reflects the interaction between mental and physical activities and worker's functional capabilities, health and subjective assessment of their status in given organizational and social conditions (Tuomi et al., 1998). The work ability index (WAI) was developed in Finland and is based on data collected from periodic health examinations and workplace surveys. Its goal is to promote a healthy quality of working life (Tuomi et al., 2001). The use of the WAI in research and practice has widened to several countries, with translation into 24 languages (Ilmarinen, 2007).

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Females are reported to have significantly lower WAI compared to their male counterparts (Camerino et al., 2006). This difference may be related to gender-roles (Musshauer et al. 2006); the “economic and social roles which a society considers appropriate for men and women” (p. 383–384). Musshauer et al. (2006) used the expression “gender-coded factors” to refer to all types of social variables that differ between males and females due to their assigned gender role. For example, females perform a greater share of domestic tasks.. Thus, differences between males and females in occupational health outcomes may derive from the persisting gender imbalance in domestic work (Strazdins and Bammer 2004).

Female workers are known to experience a “double work burden” resulting from their simultaneous engagement in a paid employment plus a greater share or complete responsibility of the domestic load (Kergoat, 1989). Therefore, the imbalance in gender work is a fundamental issue to be considered when analyzing the relationships between gender and work and health (Artazcoz et al., 2001). Some authors emphasize that health outcomes may be mutually influenced by professional and domestic work (Lindfords et al., 2006; Portela et al., 2005; Krantz and Ostergren, 2001). Paid and unpaid work in the home and social support are important elements in the social production of health and illness, though their combined effects on both women and men. However, the research literature has only recently made this a focus (Walters et al., 1996).

Nursing teams in Brazil comprise a peculiar working group regarding working hours as they often have two jobs. A second job is taken mainly due to low wages and the present work schedules which do not require consecutive working days. However, the outcome for nurses is long professional working hours (Portela et al., 2004; Borges et al, 2003; Aquino et al., 1993). These long working hours added to domestic work and childcare represent the so-called “double or triple work journey” (Aquino et al., 1993). Thus, the characteristics of this particular occupational group provide further cause to understand the impact of their individual and combined contribution on well-being.

The present study is based on the hypothesis that there is an association between long work hours and lessened or inadequate work ability, and that this association differs for males and females. The study aims to add to the small literature base on assessing the relationship between professional work hours, domestic demands and their combined influence on work ability for male and female workers.

2. Methods

Sample and Procedure

Participants were drawn from three hospitals in Rio de Janeiro. Eligible participants were those directly providing patient care and this included nurses, nursing assistants and nurses’ aides. Approval to conduct the research was first granted by the ethics committee from the Oswaldo Cruz Foundation, and from each of the hospitals.

A comprehensive two-part survey was completed by the participants. The first part provided detailed information on professional work hours, domestic work hours, and some questions on health. We used trained interviewers to record this information from participants as a means to increase the accuracy of the data. Interviewers underwent a training course that covered the aims of the study and particular emphasis was placed on the peculiarities of working hours in this group (e.g. type of shifts, number of jobs). The interviewer’s role was also to assist participants understanding of the research by providing clarification. The second part of the survey included the WAI questionnaire (Tuomi et al., 1998). The final version of the instrument was based on three rounds of pre-tests (N=50) to improve the clarity of the survey items and

a pilot study with nurses and nursing assistants (N=90) from a public hospital with a similar profile to the target population.

Materials

Data collection was based on a comprehensive instrument (about 300 questions) that considered the participants working arrangements including those from a second job (Portela et al., 2004) and the hours spent on housework per week. In addition, we also examined any informal changes in work schedules agreed to by the workers (Ribeiro-Silva et al., 2006).

In addition, the instrument also included information on the participant's sociodemographic characteristics, physical and mental health symptoms, life styles, sleep complaints, recovery from work, time management for non-professional activities, and several scales to identify the psychosocial factors at work. Besides exposure and dependent variables (see below), the following items were considered for the present study: (i) sociodemographic data: gender, age, marital status, children, ethnicity, education degree, monthly family income, (ii) work variables: professional category, time in nursing activities, type of contractual employment, working hours, and number of working nights; (iii) lifestyle and health-related behaviors: smoking and drinking habits, physical activity.

Definition of exposure and dependent variables

Three variables were used as exposure variables: professional work hours, domestic work hours and total work load (sum of professional and domestic hours). The number of professional work hours was based on the question: *Now let's recall the hours which you dedicated to professional nursing each day of last week (in all the places)*. Interviewers recorded the actual time participants arrived at the hospital and left it on a daily basis, regardless of the official work schedules. Workers then answered the following question: *"Do these hours of professional work identified in the previous question correspond to your normal activity?"* Possible answers were: *"Yes"/"No, you usually work MORE HOURS a week (You missed work once last week)"/"No, you usually work LESS HOURS a week (You covered a shift for someone or worked overtime on your shift last week)"*. Test-retest reliability as measured by the intraclass correlation coefficient was 0.681 (CI 0.501–0.804) for the professional work hours.

The estimate of hours spent on housework was based on the question *"This last week, how many hours approximately, did you dedicate to housework?"* The interviewers recorded the start and end times for these activities. To ensure this load was indicative of their normal load, they were asked: *Do these hours of housework identified in the previous question correspond to your normal domestic activity?* Possible answers were: *"Yes"/"No, you usually do housework MORE HOURS a week"/"No, you usually do housework LESS HOURS a week"*. Test-retest reliability as measured by the intraclass correlation coefficient was 0.678 (CI 0.487–0.807) for domestic work hours.

To examine our hypothesis that there is an association between long work hours and inadequate work ability, we included in the analysis only workers who answered *"Yes"* and those who answered *"No, you usually work MORE HOURS a week"*, as they correspond to workers who usually work at least the reported hours. The same procedure was adopted for the analysis of domestic work hours. Since we used information based on recall, we excluded data from workers who had not been at work in the previous week.

The work ability index (WAI) was used as the dependent variable. This index reveals how well a worker is able to perform his or her work. It is determined on the basis of the answers to a series of questions which considers the physical and mental demands of the work and the worker's health status and resources. The questionnaire comprises the following items: current

work ability compared with the lifetime best, work ability in relation to the demands of the job, number of current diseases diagnosed by a physician, the estimated work impairment due to diseases, sick leave during the past year, their own prognosis of work ability two years from now, and mental resources (Tuomi et al., 1998). The Brazilian version (Fischer et al., 2005) of the WAI was included in the second part of the instrument. The WAI score varies from 7 to 49 with higher scores indicating better work ability. The resulting WAI scores were then categorized into two groups: inadequate (poor and moderate WAI scores) and adequate (good and excellent WAI scores) scores. The cut-off points for adequate/inadequate work ability were based on age values suggested by Kujala et al (2005). For the younger participants (19 – 34 years old) values below 40 points defined inadequate work ability. For older employees (≥ 35 years old) a WAI score < 37 points was used to define inadequate work ability.

Data analysis

The analysis of the relationship between the exposure variables and the WAI was performed in two steps. First, potential confounders were screened by chi-square tests; those with at least a minimum association ($p \leq 0.10$) were selected for inclusion in the logistic regression models. The following variables were tested as confounders: age, family income, education degree, marital status, children at home (up to 14 years old), ethnicity, physical activity, smoking and drinking habits, professional category, hospital, time on nursing profession, and number of working nights. In addition, domestic work hours were examined as a confounder in the association between professional work hours and work ability. Similarly, professional work hours were tested as a confounder in the association between domestic work hours and work ability.

Second, the logistic regression analysis was used to test the association between each exposure variable and inadequate WAI with results presented as odds ratios with 95% confidence intervals. The results of regression analysis refer (i) to the crude association between the exposure and WAI, (ii) to the association including only age as a confounder, and (iii) to the association adjusted by age and then including each confounder separately. All statistical procedures are based on significance at 0.05. Analyses were performed with SPSS (version 13.0) software.

3. Results

A total of 1,687 eligible workers were invited to participate in the study. Of these 57 declined the offer, 74 were on sick leave, and 47 had been on vacation or on a leave in the two weeks before the interview. A further 271 workers (225 females and 46 males) were excluded because they reported to have worked more hours than their usual pattern. The final studied group comprised 1248 workers (74%); 1092 females and 156 males.

Mean age for the whole group was about 40 years old, with no significant difference between male and female groups. The male group had a higher proportion for being married whereas females, had a higher proportion of being divorced/separated. The remaining sociodemographic variables were not significantly different between men and females. The proportion of males who reported smoking habits and the consumption of alcoholic drinks were higher than among females, while the proportion of males who reported no physical activity was lower than for females.

We found no significant gender differences for professional category, type of contractual employment, and time in the nursing profession. The high variability in data concerning time in nursing is related to the recent entry of workers into the hospital system through outsourcing, so that a great proportion of workers are young with little nursing experience. A higher proportion of males worked nights compared to females. A lower proportion of inadequate

WAI was observed among men (25.6% V's 40.5% for males and females respectively). The professional work hours were significantly longer among males (51.9 V's 46.7 hours/week), whereas females reported significantly longer domestic work hours (16.4 V's 7.8 hours per week). The standard deviations were quite large however for both males and females. This is likely to be due to different sociodemographic status observed in the group, so that registered nurses are likely to have more support from a maid at home, as compared to nursing aides thus contributing to differences among the group. No significant difference was detected between men and females as to the total work load (Table 1).

A significant association was observed between professional and domestic work hours both for males ($r_s = -0.181$; $p = 0.029$) and females ($r_s = -0.254$; $p < 0.001$).

Among females, no significant association was observed between professional work hours and inadequate WAI. Regarding domestic work hours, the significant association observed in crude data is lost when confounders (age, marital status, family income and professional work hours) are included in the model. The total work load was significantly associated with inadequate WAI among females regardless of age, family income and the number of working nights (see Table 2a).

In males, the significant association between professional work hours and inadequate WAI, regardless of age and the number of working nights, is lost with the inclusion of professional work category to the model. No association was observed between domestic work hours and WAI. The same results hold true for the total work load (see Table 2b).

4. Discussion

Our findings confirm the hypothesis of an association between long work hours and WAI for the female sample, but not for males. For females, the total work load was shown to be significantly associated with inadequate work ability, after adjusting for age, monthly family income, and the number of working nights. As neither professional nor domestic work hours were significantly associated to inadequate WAI, it seems that there is a cumulative effect of professional and domestic work hours resulting in work overload for the female group.

According to Lundberg (1996), women's occupational role has changed without concomitant changes of the traditional responsibility for home and family, and this can contribute to stress and long-term health risks. In the present study household tasks are given the status of housework/unpaid work because of the assumption that work corresponds to any activity necessary for the maintenance of society (Waissmann, 2003). Our view is shared by other authors who consider both professional and domestic load in the analysis of females' health (Berntsson et al., 2006; Bjorksten et al., 2001; Brisson et al., 1999; Krantz et al., 2005; Lundberg et al., 1994). In the context of those studies, our results are partly in accordance with those obtained using a white-collar sample by Krantz et al. (2005) The authors found an interaction between work conditions and household only for female's health, while males responded more selectively to professional work hours. It may be the case that our male sample lacked sufficient statistical power to observe any effects. A tendency for an association between long work hours and inadequate work ability among males may be inferred, based on their higher OR's compared to females for both professional work hours and total work load. Several studies refer to the negative impact of long professional work hours on health (*e.g.*, Van der Hulst, 2003) so it is plausible that WAI could reflect the effects of prolonged exposure to excessive work hours.

The professional working hours obtained in our study stand in marked contrast to the weekly 30-hours system recommended by the Brazilian nurses' unions. Long working hours in this sample are generally associated with having a second job. These results show an important

characteristic of the current working arrangements in Brazilian hospitals: The lack of consecutive working days allows time for engaging in a second job. The outcome of these arrangements is that a potential risk of exposure to 'total' working hours is not considered (Dembe et al., 2005).

No significant difference was observed between males and females for total work load. Moreover, in both males and females there was a significant negative association between the numbers of hours devoted to work at hospitals and domestic work hours. Thus, a compensatory mechanism seems to exist both in females and males, so that the high work load is likely to derive from high number of worked hours either at the hospital(s) or at home. Despite this, females seem to experience more the negative consequences of long work hours. Concerning this aspect Kranz et al. (2005) referred to a higher risk of health symptoms among females devoting more time to both paid and household work. Data on females from a similar population showed that those with long professional work hours were more likely to complain about the lack of time for leisure and rest than those working fewer hours (Portela et al., 2005). Other factors that can mediate the difficulties faced by females is related to the need for recovery from work-induced fatigue as it depend on the recovery time, which may differ between males and females due to different family roles (Jansen et al., 2003).

Some issues deserve attention when analysing gender profiles as to work hours and work ability. Males dedicated to professional work, on average, five hours more per week in comparison to females whereas female nurses spent more time doing housework compared to the male group. Another issue to be considered is the higher proportion of inadequate WAI scores observed among females compared to males (40.5% versus 25.6%). This is of concern for two reasons. First, age and time in the nursing profession are known to influence WAI (Hasselhorn et al., 2005) but we found no differences between males and females. Second, a greater proportion of males were engaged on nightwork, which is a known risk factor for low work ability (Costa, 2005). Therefore, since age, time in the nursing profession and nightwork cannot explain the impaired work ability in females; this seems to point to domestic load as a possible explanation. The contribution of domestic work hours to the total work load which was higher among female than among male workers (25.9% versus 12.9%, as detected by mean values) could be a candidate for reducing work ability, among other gender-related factors not studied here. The lower WAI among females confirms data from the NEXT Study concerning nurses from 10 European countries that showed higher work ability scores among males in all countries (Camerino et al., 2006). Results support an argument for considering the interplay between the home and paid work domains particularly among female samples. Data cannot be generalized to other populations and occupational groups, as educational level and socioeconomic status are important factors to be considered (Artazcoz et al., 2004). When analysing the potential beneficial aspects of multiple roles, Berntsson et al. (2006) emphasized that "it is not only a question of whether many roles are a resource or a burden; it may also be that such a situation is beneficial to a certain level but becomes a burden when the workload becomes too high" (p. 1070).

Our findings require some caution in their interpretation. We excluded workers that were absent from work for medical reasons and this suggests our data may be reflecting a 'healthy worker effect' (Checkoway et al., 1989). If this is true however, the associations between long work hours and WAI presented here are underestimates of the true effect. In addition, the cross-sectional design of our study does not allow a causal relationship to be argued.

5. Conclusion

Females usually have multiple roles ranging from domestic responsibilities to paid work. The cumulative and conflict generated by these multiple roles may have negative effects on workers

lives, such as stress, depression and physical symptoms (Barnett and Hyde, 2001). The combination of professional and domestic work is relevant to the evaluation of the impact of work overload on female nurses' health. Further investigations focusing on similarities and discrepancies between female and male groups with sufficient sample sizes will help in clarifying the gender aspects and well-being, particularly those concerning work ability.

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Table 1
Profile of nursing personnel on sociodemographic, lifestyle and work variables
(N=1248).

CHARACTERISTICS	Females (N=1092)	Males (N=156)	p value*
Sociodemographic data			
Age – mean (standard deviation)	40.2 (12.8)	39.4 (12.5)	0.480
Marital status (%)			0.022
Single	34.3	37.8	
Married/live with partner	43.9	50.0	
Divorced or separated	21.7	12.2	
Presence of children up to 14 years old (%)	27.3	29.5	0.566
Monthly family income (in US\$)			0.079
Up to 216	27.7	33.3	
217 to 433	38.9	41.2	
434 to 650	18.7	10.5	
665 or more	14.7	15.0	
Lifestyle and health-related behavior variables			
Smoking habits	28.6	42.9	<0.001
Consumption of alcoholic drink	33.2	48.7	<0.001
No physical activity	70.7	54.5	<0.001
Overweight or obese	44.4	51.6	0.095
Variables related to work			
Professional category (%)			0.972
Nurses	28.4	27.6	
AND	18.7	19.2	
Nursing aides	52.9	53.2	
Time on nursing profession - mean (standard deviation)	14.8 (11.2)	15.2 (11.4)	0.680
Type of contractual employment			0.959
Permanent jobs	54.8	55.0	
Precarious jobs	45.2	45.0	
Night work	42.0	56.8	<0.001
Inadequate work ability (%)	40.5	25.6	<0.001
Professional work hours – mean (standard deviation)	46.7 (19.1)	51.9 (22.3)	0.002
Domestic work hours – mean (standard deviation)	16.4 (15.3)	7.8 (12.0)	< 0.001
Total work load - mean (standard deviation)	63.1 (21.6)	60.2 (24.0)	0.126

* comparisons by chi-square and *t* test for categorical and continuous variables, respectively

Table 2**Table 2a. Association between work hours and inadequate work ability among female nursing personnel (N=1092).**

Model	OR	CI95%	p value
Professional work hours (PWH)			
Model 1 = PWH	1.003	0.992–1.008	0.426
Model 2 = PWH + age	1.005	0.999–1.012	0.123
Model 3 = PWH + age + marital status	1.005	0.998–1.011	0.172
Model 4 = PWH + age + monthly family income	1.005	0.999–1.012	0.125
Model 5 = PWH + age + number of working nights	1.006	0.998–1.014	0.144
Model 6 = PWH + age + domestic work hours	1.006	0.999–1.013	0.080
Domestic work hours (DWH)			
Model 1 = DWH	1.009	1.001–1.017	0.027
Model 2 = DWH + age	1.006	0.998–1.014	0.156
Model 3 = DWH + age + marital status	1.007	0.999–1.017	0.096
Model 4 = DWH + age + monthly family income	1.007	0.998–1.015	0.119
Model 5 = DWH + age + number of working nights	1.007	0.999–1.015	0.106
Model 6 = DWH + age + professional work hours	1.008	0.999–1.016	0.077
Total work load (TWL)			
Model 1 = TWL	1.006	1.001–1.012	0.024
Model 2 = TWL + age	1.006	1.001–1.012	0.023
Model 3 = TWL + age + monthly family income	1.007	1.001–1.012	0.020
Model 4 = TWL + age + number of working nights	1.008	1.002–1.013	0.015

Table 2b. Association between work hours and inadequate work ability among male nursing personnel (N=156)

Model	OR	CI95%	p value
Professional work hours (PWH)			
Model 1 = PWH	1.016	0.999–1.032	0.067
Model 2 = PWH + age	1.017	1.000–1.034	0.056
Model 3 = PWH + age + professional category	1.015	0.098–1.033	0.089
Model 4 = PWH + age + number of working nights	1.023	1.001–1.045	0.042
Model 5 = PWH + age + domestic work hours	1.017	1.000–1.035	0.054
Domestic work hours (DWH)			
Model 1 = DWH	1.004	0.975–1.035	0.782
Model 2 = DWH + age	1.005	0.975–1.037	0.729
Model 3 = DWH + age + number of working nights	1.005	0.974–1.036	0.767
Model 4 = DWH + age + professional work hours	1.005	0.974–1.038	0.751
Total work load (TWL)			
Model 1 = TWL	1.014	0.999–1.030	0.073
Model 2 = TWL + age	1.014	0.999–1.030	0.070
Model 3 = TWL + age + professional category	1.012	0.996–1.029	0.141
Model 4 = TWL + age + number of working nights	1.017	0.999–1.036	0.069