ORIGINAL ARTICLE

Development and implementation of a participative intervention to improve the psychosocial work environment and mental health in an acute care hospital

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Objectives: To describe the development and implementation phases of a participative intervention aimed at reducing four theory grounded and empirically supported adverse psychosocial work factors (high psychological demands, low decision latitude, low social support, and low reward), and their mental health effects.

Methods: The intervention was realised among 500 care providers in an acute care hospital. A prior risk evaluation was performed, using a quantitative approach, to determine the prevalence of adverse psychosocial work factors and of psychological distress in the hospital compared to an appropriate reference population. In addition, a qualitative approach included observation in the care units, interviews with key informants, and collaborative work with an intervention team (IT) including all stakeholders.

Results: The prior risk evaluation showed a high prevalence of adverse psychosocial factors and psychological distress among care providers compared to a representative sample of workers from the general population. Psychosocial variables at work associated with psychological distress in the prior risk evaluation were high psychological demands (prevalence ratio (PR) = 2.27), low social support from supervisors and co-workers (PR = 1.35), low reward (PR = 2.92), and effort-reward imbalance (PR = 2.65). These results showed the empirical relevance of an intervention on the four selected adverse psychosocial factors among care providers. Qualitative methods permitted the identification of 56 adverse conditions and of their solutions. Targets of intervention were related to team work and team spirit, staffing processes, work organisation, training, communication, and ergonomy.

Conclusion: This study adds to the scarce literature describing the development and implementation of preventive intervention aimed at reducing psychosocial factors at work and their health effects. Even if adverse conditions in the psychosocial environment and solutions identified in this study may be specific to the healthcare sector, the intervention process used (participative problem solving) appears highly exportable to other work organisations.

Sick leave due to mental health problems has increased over the past 20 years in many industrialised countries.[1] Mental health disorders are among the most common, costly, and debilitating types of health problems in the working age population. They often rank as the first or second most common cause of extended sick leave from work,[2 3] exceeded only by musculoskeletal problems. The International Labor Organisation considers that psychosocial problems make up, in the world, one of the principal causes of accidents, illness, absenteeism, and death in the workplace.[4]

In the province of Québec, surveys among a representative sample of the population point to mental health problems as the leading factor responsible for an increase of absenteeism from work.[5] Among healthcare personnel, the costs of health insurance indemnities have increased by 25% between 1993 and 1999, mainly due to a rise in mental health problems.[6] That period has also been one of sweeping reform, restructuring, and downsizing within the healthcare system, as part of an effort to cut down on healthcare costs and improve efficiency. Nurses' working conditions deteriorated during the restructuring because human and material resources were greatly reduced while the volume of patients and the severity of their medical condition increased. Accordingly, significant increases in psychological demands, low control, low social support at work, and psychological distress among nurses were reported.[7]

Many studies have documented the effect of adverse psychosocial work factors on the incidence and the prevalence of mental health problems. Karasek's job demand-control-support model[8] and Siegriest's effort-reward imbalance model[9] identify four psychosocial factors in the work environment whose effects on physical and mental health have been the most frequently documented.[10] The demand-control-support model has two primary components: psychological demands (PD) (quantity of work, intellectual requirements, time pressure); and control or decision latitude (DL) (use and development of skills, control over work which implies latitude at work, and participation in decisions). According to this model, job strain occurs when high psychological demands are accompanied by low control. To this model is added a third component that takes into account social support of co-workers and supervisors (SS).[11] Siegrist's effort-reward imbalance model (ERI) is focused on the lack of reciprocity between efforts extended and rewards obtained (esteem, respect, job status, income, and career opportunities).[9] Several longitudinal studies have reported that workers exposed to these adverse psychosocial work factors had a higher prevalence or incidence of mental health problems[3 12 13] and a higher risk of taking sick leave for mental health reasons.[14]

Few studies have evaluated the impact of interventions aimed at reducing these adverse psychosocial work factors and their health effects, and available studies have important limitations.[5 15] A 20 year review of job stress preventive interventions, concluded that interventions mostly target individuals rather than work organisation by implementing

stress management programmes instead of decreasing adverse psychosocial work factors.[16] Many authors suggest that organisational approaches are more effective and have more important, longer lasting effects than individual approaches.[16] Limitations of research on preventive interventions include absence of a sound theoretical model as the basis for intervention, lack of senior management involvement, and of prior risk evaluation.[16] In studies that have measured improvements in psychosocial work factors, significant decreases in symptoms associated with mental health and sick leave, from 9% to 55% were observed.[17 18]

Goldenhar and colleagues[19] proposed a three phase process for conducting occupational health and safety intervention research. The development phase aims to answer questions related to the changes needed and the best ways to bring them about, the barriers preventing these changes from happening and the theories that might apply in the specific intervention context. The implementation phase is concerned with the means put in place in order to produce changes to the work environment. It describes what types of changes were implemented, what difficulties were encountered, how many and who in the target population was involved. Lastly, the effectiveness phase aims to show whether the intervention was successful in reducing the prevalence of adverse work factors and of illnesses. Few studies integrated these three phases.

The objective of this paper is to describe the development and implementation phases of a participative intervention aimed at reducing four theory grounded and empirically supported adverse psychosocial work factors (high psychological demands (PD), low decision latitude (DL), low social support (SS), and low reward), and their mental health effects. The intervention was performed among 500 care providers in an acute care hospital. The effectiveness phase is presented in a companion paper in this issue of the journal.*

METHODS

Before the start of the study, a preliminary phase allowed identification of the targeted hospital as well as consciousness raising about the project among all those concerned (Summer 1999). Next, a prior risk evaluation was performed (Spring 2000), using a quantitative approach, to determine the prevalence of adverse psychosocial work factors and of psychological distress in the hospital compared to an appropriate reference population. In addition, a qualitative approach included observation in the care units (Summer 2000), interviews with key informants (Autumn 2000), and collaborative work with an intervention team (IT) including all stakeholders (Winter and Spring 2001).

The intervention was defined as changes undertaken by the hospital to reduce adverse psychosocial work factors. This includes solutions proposed by the IT and adopted by the nursing department, as well as any other change introduced in the workplace with the explicit goal (or the clear consequence) of improving one of the four adverse psychosocial factors under study. Decisions concerning these changes are made by managers, the intervention implementation being the institution's responsibility.

Preliminary phase

A hospital was selected for the intervention on the basis of previous research showing high prevalence of adverse psychosocial work factors and psychological distress among nurses. A meeting was held with representatives from the Nursing and Human Resources management to obtain their commitment to conducting the research within their institution. The researchers presented previous research results on nurses' work conditions and health, the theoretical framework, the research objectives, and the anticipated phases of the project.

A presentation was also made to nurses' and beneficiary attendants' local unions representatives in order to obtain their adherence and collaboration to the research and to care providers in the hospital. These encounters provided researchers with insights into how work organisation and mental health were perceived. They also constituted an opportunity to increase awareness of the research among employees and to emphasise the importance of their participation. Moreover, the main investigator presented the research to all head nurses during one of their statutory meetings and in local journals. A poster inviting participation to the prior risk evaluation was placed on each care unit where a $50 worth lottery for a meal at a restaurant or a massage was organised as an incentive to participate (15–20 lotteries in all).

Prior risk evaluation

A prior risk evaluation was conducted to establish a quantitative picture of the hospital care units. These data constituted the pre-intervention measure for the evaluation of the effectiveness of the intervention. They were also used to identify the care units which were the most susceptible to gain from an intervention—that is, those who had a high prevalence of adverse psychosocial work factors and/or psychological distress compared to other units and to a reference population. Telephone interviews were used to determine the prevalence of four psychosocial factors at work (high psychological demands, low decision latitude, low social support, and effort-reward imbalance), and psychological distress among care providers.

The reference group was composed of all workers who had participated in the Québec Health Survey (QHS) in 1998.[20] The QHS was conducted in a stratified random sample of all Québeckers appearing in the records of the Québec Insurance Board (which covers more than 95% of the population). The weighted sample is representative of non-institutionalised Québeckers at the time of the survey.[20] A subgroup was selected with characteristics similar to the care providers under study. After excluding participants who did not hold a paid job, the sample was restricted to participants holding a college or university degree (same educational range as the care providers). The reference population thus comprised 5095 individuals holding different types of jobs in various industrial sectors and services. In this population, data for comparison were measured by self-administered questionnaire with the same instruments as were used in our study and primary data were available for the analyses.

Psychological demands and decision latitude were evaluated using 18 items from Karasek's job content questionnaire (JCQ).[8 21] The validity of the JCQ was assessed in national population based studies in the United States.[8] The psychometric qualities of the French version of this instrument have been demonstrated.[22] Social support at work was measured by eight items from the JCQ.[21] Reward at work was measured by 11 items from Siegrist's original instrument for which factorial validity and internal consistency are documented.[9 23] The effort dimension of the Siegrist ERI model was substituted in this study by the psychological demands dimension. In our study, internal consistency based on Cronbach's coefficient alpha was 0.71 for job decision latitude, 0.76 for psychological demands, 0.81 for social support, and 0.77 for reward.

Psychological distress was measured using an abridged version (14 items) of a validated instrument, the Psychiatric

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Symptom Index (PSI).[24] The French version of the PSI was validated in a Québec health survey.[25] Burnout was measured using questions from the Copenhagen Burnout Inventory[26] which measures personal burnout (fatigue, physical or emotional burnout, etc), work related burnout (emotionally draining work, frustration associated with work, etc), and client related burnout. This instrument is used in several countries and studies have provided support for its validity.[26] Sleeping problems were measured using five questions from the Nottingham Health Profile (NHP).[27] The French version of the NHP was validated in a French national survey.[28] In our data, Cronbach's alpha coefficient was 0.91 for the total score of PSI, 0.88 for personal burnout, 0.86 for work related burnout, 0.79 for client related burnout, and 0.78 for sleeping problems. Perceived general health status was measured by a question from the Short-Form Health Survey (SF-36)[29] validated in French by the Québec Health Survey (QHS).[30] Three questions on the use of health or social services during the two weeks preceding the questionnaire were likewise taken from the QHS.[30]

Observation in the care units

Direct observations in the care units took place after the prior risk evaluation. They were intended to gain a better understanding of the setting, work organisation, and working conditions with respect to the research theoretical models.[31] Notes recorded during these observations were compiled using a data collection grid composed of several indicators underlying each of the four psychosocial factors, inspired by Bélanger and colleagues[31] and adapted to the hospital setting.[32] The observation contributed to identification of certain themes to be included in the interviews with key informants. It also allowed the identification of preliminary targets for the intervention. On average, 20 hours of observation per care unit took place and 11 of the 14 care units (clinical services) were visited. Two care units were not observed because they were going through restructuring and were excluded from the eligible target units for the intervention. The third one was excluded from observation because it had recently been the object of a report which gave an extensive description of the work organisation in this unit. The observations were made during the day, evening, night, and weekend shifts and were concluded when information was complete. Together with the prior risk evaluation, the observations also helped to identify three care units that would be directly involved with the IT.

Interviews with key informants

Five interviews were conducted to gain understanding of the environment of the care units targeted for the intervention and to facilitate the research team's subsequent work with the IT. The interview grid was designed according to themes developed during the observation process, namely favourable and unfavourable conditions for intervention: organisational constraints, communication problems, quality of social interactions, and conflicting needs and priorities. The interviews were conducted as semi-structured, 90-minute, one-on-one encounters with the head nurses of each targeted care unit, one nursing coordinator and one staff nurse, all of whom had solid knowledge of daily operations in one or many care units based on their professional nursing experience, thus allowing saturation of the needed information. The interviews were subject to exhaustive note taking. Content analysis was done, first vertically to extricate each theme covered by the informants, then transversely, so as to construct a coherent representation of each theme covered.[33] This analysis was corroborated by a validation step with the interviewees.

Intervention team

The participative approach with the IT including care providers and other important stakeholders,[17 34] aimed to determine what changes should be introduced to reduce adverse psychosocial work factors and the best way to implement these changes. The IT was implemented according to the principles of German health circles[35] which have shown their effectiveness in the prevention of stress at work in Europe.[36] The principles of these health circles are: (a) operating in small groups; (b) group members not of the same hierarchical level; (c) regularly scheduled work meetings; (d) preferably 8–10 meetings; (e) meetings led by an external moderator; and (f) individual knowledge of team members used as input for finding solutions to adverse factors. The ultimate objective of these health circles is to recognise and eliminate problems at their source. The IT goals were to identify adverse psychosocial work factors in the three targeted care units, recommend interventions to reduce them, and determine intervention feasibility and priorities. IT members were also responsible for the dissemination of information from the IT meetings to their colleagues and for providing the IT with feedback (comments and reactions). An additional responsibility was to identify ways to promote diffusion and appropriation of the intervention process by management and staff of the other care units.

Recruitment criteria for IT care providers were: willingness to become actively involved in the IT, sound knowledge of both their and other hospital units (operations, specific characteristics, clientele), ability to mobilise and consult co-workers, sound judgement and open-mindedness, interest in learning how to identify and reduce adverse factors at work, willingness to share this acquired knowledge with co-workers, and ability for team work. Only one care provider volunteered to be part of the IT, the others were asked to participate by their head nurse. Human resources and the nursing department, as well as unions, each appointed one representative among volunteers with a keen interest in the IT.

The IT thus included two researchers, one research assistant, three head nurses and three registered staff nurses (one from each targeted care unit), one beneficiary attendant and one reception clerk, one representative from human resources and one from nursing, as well as two local union representatives (nurses and beneficiary attendants' unions). The hospital administration agreed to free up (with pay) and replace IT care providers, allowing them to attend meetings. They were also released from their duties after each IT meeting for the equivalent of a half day to meet with co-workers from the three shifts in their respective care units, to disseminate IT information, and to gather comments and suggestions. Unions' IT members conducted the same exercise with their union members.

During eight 3-hour meetings held over a four-month period, two researchers accompanied the IT work in identifying specific adverse psychosocial work factors and their solutions. IT members learned to work together, and this eventually led to the creation of IT ''sub-committees'', bringing together interdisciplinary IT members with the objective of collaborating on specific mandates. For example, a sub-committee regrouped nursing and human resources members and the beneficiary attendants' representative to work on the problem of patient transport in the hospital. The head nurses worked together on the question of communication between nursing staff and medical doctors in the hospital. After each IT meeting, a report was produced for validation and diffusion. It included a table listing every adverse psychosocial conditions identified and solutions proposed by IT members.

This research has been approved by the ethics committee of Laval University and by each ethics committee of the hospitals in the study.

RESULTS

Prior risk evaluation

Participation rate to the telephone interviews was 73.0%. Participants were comparable according to gender, age, job title, and work schedule (table 1). However, junior workers and temporary employees responded more often than senior and regular employees.

The prevalence of psychosocial factors and psychological distress among participants in the hospital was compared with that of workers from the 1998 Québec Health Survey. The comparison with this reference population revealed that several targeted psychosocial factors, as well as psychological distress, were more prevalent in the hospital (table 2).

The prior risk evaluation contributed to identify the care units targeted by the IT. Two of these units had the highest prevalences of psychological distress, 52% and 42% compared to 21% in the reference population and 31% for the whole hospital. The other unit was suggested by the nursing department director because it had recently gone through a merger of two medical specialties and was experiencing a lot of strain. All three units had levels of job strain either greater than (38% and 27%) or equal to the reference population (20%). The targeted units included 90 of the 674 care providers in the experimental hospital (13%).

Psychosocial variables at work associated with psychological distress were high psychological demands (prevalence ratio (PR) = 2.27), low social support (PR = 1.35), low reward (PR = 2.92), and effort-reward imbalance (PR = 2.65) (table 3). Low decision latitude and job strain were not associated with psychological distress in the prior risk evaluation.

Observation in care units

Observation notes and information collected from head nurses were used to produce a brief monographic description of each care unit, according to the theoretical models on psychosocial factors at work. Observation contributed to identification of themes related to favourable and unfavourable conditions for the intervention that were to be discussed in depth during interviews with key informants. Observation also allowed better understanding of staff and head nurses' discourse and preliminary identification of targets for intervention that would later be discussed with the IT: patients' bell ringing all the time, lack of space at nurses' work station, use of temporary personnel in replacement of others, and increasing demands on regular staff.

Interviews with key informants

Based on themes developed during observation, interviews with key informants were related to elements favourable and unfavourable to the participative intervention (table 4). This phase of the study allowed the researchers to lay the foundation for optimal IT work.

Intervention team

The IT identified many adverse work conditions which, over time, were listed, described in more detail, and finally synthesised under 56 intervention targets that were then classified according to problem category (team work and team spirit, staffing, work organisation, training, communication, and ergonomy) and according to the four psychosocial factors (any work condition could be linked to more than one psychosocial factor) (table 5). The most frequently cited problems concerned psychological demands (43%), reward (24%), decision latitude (20%), and social support at work (13%).

Unsatisfactory team work and team spirit were mentioned on several occasions by IT members who reported a lack of recognition or respect from others and a lack of social support. Under the category ''staffing'', psychological demands were increased by the lack of stability of team units, which led to a need for frequent renewed training and greater supervision by regular staff. IT discussion also revealed shortfalls related to communication and

Table 1 Proportions of participants according to different characteristics; prior risk evaluation

Characteristics	Total eligible	Participants	Response rate (%)	p value*
Men	138	107	77.5	0.198
Women	536	385	71.8	
Age (in years)				
18–24	73	59	81.8	0.411
25–34	127	94	74.0	
35–44	242	174	71.9	
⩾45	232	165	71.1	
Seniority (in years)				
<1	71	58	81.7	0.038
1–9	170	133	78.2	
10–19	258	183	70.9	
⩾20	175	118	67.4	
Occupational status				
Regular full time	327	226	69.1	0.035
Regular part time	235	175	74.5	
Temporary	112	91	81.3	
Job title				
Nurses	505	357	70.7	0.097
Auxiliary nurses	18	16	88.9	
Beneficiary attendants	112	87	77.7	
Work schedule				
Day	299	215	71.9	0.236
Evening	139	101	72.7	
Night	78	52	66.7	
Variable	158	124	78.5	

*Fisher exact test for comparison of proportions of participants in each strata of each characteristic. Although the Fisher exact test is usually applied to 2×2 tables, SAS now permits application of this test to M×N tables where M>2 and/or N>2. The level of significance retained is $p<0.05$.

Table 2 Prevalence of adverse psychosocial factors at work and mental health in the hospital; prior risk evaluation

Psychosocial factors	Experimental hospital		Québec workers†
	n	% (95% CI)*	% (95% CI)
High psychological demands	412	84.1 (80.9–87.2)	43.0 (41.2–44.8)
Low decision latitude	322	65.6 (61.2–69.8)	54.0 (52.2–55.8)
Job strain			
Low demands; high latitude	19	3.9 (2.4–6.0)	–
Low demands; low latitude	59	12.0 (9.3–15.3)	–
High demands; high latitude	149	30.4 (26.4–34.7)	–
High demands; low latitude	263	53.7 (49.2–58.2)	20.0 (18.5–21.5)
Low social support (total)	212	43.6 (39.2–48.2)	–‡
Low support from supervisors	395	81.3 (77.5–84.7)	–
Low support from colleagues	305	62.8 (58.3–67.1)	–
Low reward	248	50.7 (46.2–55.2)	–
Effort-reward imbalance	331	67.8 (63.5–72.0)	–
Psychological distress	152	31.0 (26.9–35.3)	21.0 (19.5–22.5)
Client related burnout	116	23.7 (20.0–27.8)	–
Work related burnout	240	48.8 (44.3–53.3)	–
Personal burnout	188	38.2 (33.9–42.7)	–
Sleeping problems	180	36.7 (32.5–41.2)	–
General health			
Excellent or very good	301	61.2 (56.9–65.6)	–
Average or bad	55	11.2 (8.6–14.3)	–
Use of health or social services in previous 2 weeks	195	39.7 (35.4–44.2)	–
Reason for consultation: mental or emotional problem	36	7.4 (5.2–10.1)	–

*Because of small numbers in a few categories, CI have been computed with the exact method.
†Representative sample of Québec workers in 1998, adjusted for gender, age and education.
‡Data not available from the QHS.

information that prompted frustration and lack of motivation among employees who did not understand the decision making process and felt they were not consulted (decision latitude) or respected (effort-reward imbalance).

Solutions to high psychological demands were discussed on the basis of team work: team consolidation, increased staff in basic teams, and stabilisation of replacements. Solutions to decision latitude shortcomings included job enrichment, training, and consultation of nurses from all work shifts in the decision making process. Social support was discussed within the context of determining better means for dissemination of information (work meetings). Lastly, effort-reward imbalance discussions focused on improving team communication and recognition of each care provider's work.

A report of the IT work was produced for the hospital management, containing recommendations for solutions, ranked according to priority and feasibility. Various solutions have already been applied. They were related to conditions that could be easily resolved and managed by the units (ergonomic changes, transmission of information on the evening and night shifts, management of replacements at the unit level rather than at the hospital level to favour greater stability of the personnel, regular work team meetings, special training to cover specific needs such as palliative care). Other solutions requiring the support and approval of

Table 3 Adjusted prevalence ratio (PR) confidence intervals (95% CI) between psychological distress and psychosocial factors; prior risk evaluation

Psychosocial factors	Experimental hospital (n = 492)		
	Psychological distress (%)	Adjusted PR	95% CI
Psychological demands (PD)*			
Low	10.3	1.00	–
High	35.0	2.27	1.17–4.41
Decision latitude (DL)*			
High	25.4	1.00	–
Low	33.9	0.89	0.67–1.18
Job strain†			
Low demands; high latitude	10.5	1.00	–
Low demands; low latitude	10.2	0.66	0.15–2.91
High demands; high latitude	27.5	1.77	0.47–6.61
High demands; low latitude	39.2	1.59	0.43–5.95
Social support at work (SS)‡			
High	22.6	1.00	–
Low	42.5	1.35	1.02–1.77
Reward (RW)*			
High	14.5	1.00	–
Low	47.2	2.92	2.02–4.21
Effort-reward imbalance (ERI)‡			
Absent	11.5	1.00	–
Present	40.5	2.65	1.47–4.77

*Multivariate binomial regression including PD, DL, SS, RW.
†Multivariate binomial regression including job strain, SS, RW.
‡Multivariate binomial regression including PD, DL, SS, ERI.

Table 4 Favourable and unfavourable elements to the participative intervention and how they were managed during the study

Favourable and unfavourable elements	How they were managed
Importance of employer's commitment to the research and of head nurses' support of IT staff members	Principles established at the beginning of the research and reminded at many IT meetings
Communication problems within care units Preoccupation that the IT care providers would not consult their co-workers	At each IT meeting, members were invited to report on how the IT information was transmitted to colleagues and on the comments received. IT meetings' reports were also displayed for consultation on the three targeted care units
Communication problems between shifts Diffusion of the intervention among care providers working on evening and night shifts with non-overlapping work schedules with day shift	The research team presented the results of data collection and of the IT work on every shifts
Organisational constraints One frequently reported problem was overload and employee shortage	Frequent recalls that the intervention was not aimed at bringing in more financial resources to recruit additional care providers but at changing the work organisation so as to reduce adverse psychosocial work factors
Development of positive social interactions among IT members Team work had to be restored within units between nurses and orderlies	Meetings of care providers and of management allowed a better comprehension of each other's work and fostered increasing respect and collaboration
Management and employees' conflicting needs and priorities Concerns that the IT union representatives might use this tribune as a forum for union related claims	It was made clear repeatedly that IT work would not focus on collective agreement topics but on work organisation improvement
Belief that management did not take into account employees' needs	Bringing together management and employees on IT with a shared goal of identifying problems and solutions would bring mutual understanding of their respective duties and constraints, and favour better communication, and collaboration

management to be solved could only be implemented on a mid or long term basis. As they were pointed out as priorities by the IT, one or several members were entrusted to follow up on each of them. These include major physical or ergonomic changes, such as replacement of patient bell system, creation of a pool of experienced staff for replacement according to specialties, better training of new nurses during probation, enrichment of tasks for beneficiary attendants, new system of medication distribution, revision of the information and communication system through the hospital, between units, and between shifts.

DISCUSSION

In the present study, four steps were used to develop and implement an intervention among care providers in an acute care hospital. The prior risk evaluation indicated a high prevalence of adverse psychosocial work factors and psychological distress among care providers compared to a representative sample of Québec workers. There may be an underestimation of the true PR comparing the care providers to Québec workers, since there is evidence that overall levels of several morbidity parameters reported in self-reported mail questionnaires (QHS) tend to be higher than those reported in telephone interviews (this study).[37 38] The prior risk evaluation also revealed a significant association between psychological distress and psychosocial work factors. These results, consistent with previous studies,[3 7 8 39] supported the relevance of an intervention project aimed at preventing mental health problems among care providers.

The next steps consisted of observation within the care units and interviews with key informants which permitted insight to be gained into the functioning of an acute care hospital and into the specific context under study. The researchers were thus better informed and prepared to accompany the IT.

The IT was composed of the principal stakeholders in the intervention. The meetings made use of members' knowledge and favoured adherence to the participative process and commitment to finding and implementing solutions to adverse psychosocial work factors. The IT meetings provided members with a communication forum promoting the appropriation of a problem solving participative process that could be exported and implemented in other care units of the hospital without the presence of researchers. Also, the IT meetings provided members with an opportunity to become better acquainted and learn to communicate with each other as partners. As a result, 56 adverse work conditions were identified by the IT and solutions were proposed.

This study has several strengths. First, the use of a prior risk evaluation insured the relevance of an intervention project in the targeted hospital and units while observation and interviews allowed the gathering of crucial background information to characterise the problem and its setting. Second, the study relied on sound theoretical background insuring a choice of targets and solutions based on psychosocial work factors known to have an impact on workers' health. Reliance on theoretical background also has the advantage of providing validated measures for psychosocial work factors and mental health indicators. Third, the participative process relied, from the start, on management and staff involvement, thereby ensuring the application of recognised conditions for successful preventive interventions.[19 40] It has been shown that employees' participation, when it is used with a purpose of revising work organisation to increase individual decision latitude, contributes to the improvement of mental health and productivity and reduces absenteeism from work.[17] Finally, the researchers were able to help the care providers translate what they considered ''irritants'' into higher order theoretical concepts, thereby increasing their level of understanding concerning the impact of psychosocial work conditions over mental health.

The study also has limitations, the first of which is that the participative intervention process, being dependent on the availability of researchers and hospital staff, could not include representatives from all care units in the hospital. Therefore, three care units were more specifically targeted. However, the intervention was not limited to these three pilot units represented by the IT members. Many of the 56 adverse work conditions identified by the IT led to solutions applicable to all care units and changes adopted by the nursing department were implemented throughout the hospital whenever possible. Moreover, representatives from the unions, Human Resources, and the nursing department should now be able to ensure that the participative intervention process is diffused on an institution-wide basis. It is, however, difficult to determine the extent to which other units' problems were correctly identified and the intensity of the intervention within the other care units.

A second limitation is that the intervention is not complete. Some solutions have been implemented, others are in progress or awaiting decisions. It is therefore difficult to draw a complete portrait of the situation with regard to

Table 5 Intervention targets and solutions as a function of problem category and psychosocial factor

Problem category	Psychosocial factors*		Intervention targets	Recommended solutions
Team work and team spirit	REW, SS	1.	Lack of recognition and respect between nurses and beneficiary attendants (BA)	Regular team meetings
	SS	2.	Negative comments harm the work climate	Training session on team work as needed
	PD, SS	3.	Lack of mutual assistance	
	REW, SS	4.	Nurses leave it to BA to stop patients' bell	New bell system
	REW, SS, DL	5.	BA feel they are at the bottom of the social ladder and not part of the team	Job enrichment, training, schedule stabilisation, equipment availability
	REW, SS	6.	Perceived inequalities in hierarchy status of night *v* evening *v* day personnel	Remind staff that they can switch work shifts for 15 days every year Meeting reports should be made available to all
	SS, REW	7.	When confronted with negative attitudes from doctors, nurses come to doubt their own competence	Meetings with doctors to sensitise them to the problem
	DL, PD	8.	Lack of cooperation from doctors, in particular when woken up at night for medical advice	Team support
		9.	Unreasonable delays from doctors in answering calls	
		10.	Doctors sometimes leave it to nurses to be the bearers of bad news	
	REW	11.	Nurses' work is taken for granted by doctors	To discuss during team unit meetings
Staffing processes			Lack of stability of team units and unskilled personnel increase the need for supervision by nurses:	Creation of an expertise pool for replacements (stabilisation of replacements)
	PD	12.	Frequent replacements by unskilled staff	Extended training period
		13.	Trained personnel on recall list unavailable	Support and integration of new staff (better guidance, twinning, continuous training)
		14.	Shortcomings in new staff training	Self-management of replacements by unit
		15.	Frequent questions on drug use by young nurses	Provide tools (drugs and intravenous injection guide)
	PD, DL, REW	16.	Non-replacement of reception clerks causes work overload on return	Creation of a pool of trained clerks for replacement Hire and train more clerks
	PD	17.	Short probationary period	Longer probationary period in particular cases Addition of one instructor
	PD	18.	Long delays in filling positions	Make changes to staffing process
	REW, DL	19.	Last minute information about job allocation	Self-management of replacements by units
	REW	20.	Perceived inequity in job security status allocation	Information provided by head nurses
	REW	21.	Staff from unit A feel that their unit should be recognised as ultra specialised	Project is in motion
Work organisation	PD	22.	BA leaving the unit for patients transportation causes work overload for co-workers	The ''stretcher project''† should help solve the problem
		23.	Shortage of BA when emergencies occur and during night and weekends	
	PD	24.	BA work overload necessitates nurses' help	Twinning and task rotation between BA and nurses in one unit
		25.	Chronic responsibility of heavy cases to the same person	
	PD	26.	BA working for more than one unit in the same shift cause work overload when leaving the unit	Hire more BA (unit B)
	PD, SS, REW	27.	Weaker BA have physical difficulties in accomplishing certain tasks requiring physical strength	Training
	DL	28.	BA's perceived lack of control over their work. They feel that they simply obey orders	The ''stretcher project'' should help solve the problem
	REW	29.	Unpaid overtime is often mandatory to ensure patient's wellbeing. Nurses feel guilty when work is unfinished	Learn to ''let go'' at the end of the shift Improve team communication
	PD, DL, REW	30.	Lack of time for ''CARE''	Solutions to other time constraints will help
		31.	Work is done quickly and under time pressure	Mutual support and team work
	PD	32.	Work overload for head nurses	Better communicate to caregivers the nature of their work
	DL, SS, REW	33.	Frequent mandatory meetings restrain their availability	Obtain administrative support Reassign certain care taking tasks to others
	DL	34.	Nurses are uncomfortable with having to consult doctors by phone for drug prescriptions	Elaboration of new protocols and of permanent prescriptions
	PD, DL	35.	Nurses sometimes feel that excessive therapeutic measures are taken. They must comply with certain medical decisions counter to their values	Nurses training on treatment motives
	PD	36.	Vigilance is mandatory to redress errors and omissions from Pharmacy	Problem will be submitted to the nursing-pharmacy committee. A sub-committee will be charged with describing the problem objectively New ''Unidose'' system will help
	PD	37.	Long delays for Pharmacy orders completion	The new load elevator solution is under evaluation
		38.	Errors in Pharmacy orders delivered by load elevator	
	PD	39.	Inadequate Pharmacy work hours	The problem will be documented in more detail
	PD, DL	40.	The specialised unit requires workers polyvalence	Palliative care patients should be appointed to well trained care providers The hospital has a project aiming to group palliative care patients together

Table 5 Continued

Problem category	Psychosocial factors*		Intervention targets	Recommended solutions
Training	REW	41.	Perceived inequity in access to training sessions	Annual training plan available for consultation and registration
		42.	Evening and night shift care providers feel they receive only a summary of training sessions	Day shift instructors will be asked to give training sessions during evening and night shifts
	PD	43.	Training outside the unit during work hours causes overload for co-workers	Training of care providers on their unit, during their shift by a clinician
	SS, PD	44.	Emotional difficulty of having to deal with death on a regular basis	Access to psychological support as needed Training in palliative care
Communication	SS	45.	Communication problems from management to nurses and nurses to management, as well as between teams and work shifts	Revision of information and communication systems Work meetings between teams and work shifts
	DL, REW	46.	Miscomprehension of staffing process brings about feelings of not being consulted nor respected	Consultation of nurses from all work shifts in the decision making process
	PD, DL	47.	Lack of communication about patients' condition due to non overlapping work schedules	Establish overlapping schedules
	PD, DL	48.	Insufficient knowledge of patients by doctors requires nurses' assistance and disrupts their work	Implementation of a clerk's register
	REW	49.	Management of hours conversion‡ perceived as a barrier to holidays and vacation	Better and continuous communication of information (oral and written)
		50.	Misunderstanding by staff of holiday allocation	
	PD	51.	Vocabulary used varies within hospital	Exchange documents to standardise vocabulary
	REW	52.	Caregivers feel that their suggestions are not implemented	Implement suggestions through intervention team Ensure follow up and communication of interventions
Ergonomy	PD	53.	Lack of space at nurses' work station	Ergonomic rearrangements
	PD	54.	Unsafe and counter-productive disposal of televisions in patients' rooms and difficult access to patients' bathroom	Ergonomic rearrangements
	PD	55.	Patients' constant bell ringing	Installation of new bell system
	PD	56.	Software (PIMDI system) is inadequate and time consuming	Make contacts with IBM Restart PIMDI users committee Contact person available for support System will be reviewed in 2 or 3 years

*PD, psychological demands; REW, reward; LD, decision latitude; SS, social support; BA, beneficiary assistants.
†The stretcher project will create a new job category of workers who will be responsible for patients' transfers, leaving the beneficiary attendants to carry on their duties in their own units.
‡A number of work hours is guaranteed to new hired nurses and management of these hours may disturb the choice of vacation days for permanent personnel with more tenure.

implementation. In addition, as for most intervention research, changes in the workplace are beyond researchers' control. Changes may occur for various reasons such as economic context or health network and management policy. Decisions concerning these changes are made by the hospital managers. Documenting the implementation of the intervention requires an exhaustive follow up of changes throughout the research period. This follow up will be continued over the coming year.

A third limitation was related to the work climate. Team work was not customary in the organisation and necessitated a learning process by the IT members, supported by the researchers. Means of vertical and horizontal communication were also deficient and IT members had to elaborate new strategies to propagate information and ''contaminate'' the other care units within the hospital. The extent to which they were successful is difficult to evaluate.

Conclusion

This study adds to the scarce literature describing the development and implementation of preventive intervention aimed at reducing psychosocial factors at work and their health effects. Although external generalisation may be at issue in many intervention studies, use of the three phase Goldenhar model in this study helps to avoid this limitation in that scientific knowledge is produced in each of the three phases. Furthermore, the fact that the intervention is targeted on four well defined and theory grounded adverse psychosocial factors whose deleterious health effects have been demonstrated in various work settings favours its generalisation outside the healthcare sector. Although adverse conditions in the psychosocial environment and solutions identified in this study may be specific to the healthcare sector, the process of problem identification and resolution and a rigorous evaluation of the effects of preventive intervention are highly exportable to other organisations.

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Main messages

- Mental health disorders are among the most common, costly, and debilitating types of health problems in the working age population.
- The International Labor Organisation considers that psychosocial problems make up, in the entire world, one of the principal causes of accidents, illness, absenteeism, and death in the workplace.
- This study adds to the scarce literature describing the development and implementation of preventive intervention aimed at reducing psychosocial factors at work and their health effects.
- The study relied on sound theoretical background insuring a choice of targets and solutions based on psychosocial work factors known to have an impact on workers' health.
- A prior risk evaluation showed the empirical relevance of an intervention on the four selected adverse psychosocial factors (high psychological demands, low decision latitude, low social support, and low reward) among care providers to prevent mental health problems.

Policy implications

- Targets of intervention were related to team work and team spirit, staffing processes, work organisation, training, communication, and ergonomy.
- The participative process relies, from the start, on management and staff involvement, thereby ensuring the application of recognised conditions for successful preventive interventions.
- The fact that the intervention is targeted on four well defined and theory grounded adverse psychosocial factors whose deleterious health effects have been demonstrated in various work settings favours its generalisation outside the healthcare sector. Although adverse conditions in the psychosocial environment and solutions identified in this study may be specific to the healthcare sector, the process of problem identification and resolution and a rigorous evaluation of the effects of preventive intervention are highly exportable to other organisations.

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