Available online at www.sciencedirect.com
ScienceDirect
International Journal of Nursing Studies 45 (2008) 35–50
INTERNATIONAL JOURNAL OF NURSING STUDIES
www.elsevier.com/locate/ijnurstu

Work-related factors and violence among nursing staff in the European NEXT study: A longitudinal cohort study

Donatella Camerino[a,b,*], Madeleine Estryn-Behar[c], Paul Maurice Conway[a,b], Beatrice Isabella Johanna Maria van Der Heijden[d,e,f], Hans-Martin Hasselhorn[g]

[a]*Department of Occupational Health, University of Milan, Milan, Italy*
[b]*Fondazione Ospedale Maggiore Policlinico Mangiagalli e Regina Elena, Milan, Italy*
[c]*Service Central de Medecine du Travail Hôpitaux Hôtel Dieu AP-HP de Paris, Paris, France*
[d]*Maastricht School of Management, Maastricht, The Netherlands*
[e]*Open University of the Netherlands, Heerlen, The Netherlands*
[f]*University of Twente, Enschede, The Netherlands*
[g]*Department of Safety Engineering, University of Wuppertal, Wuppertal, Germany*

Received 5 January 2007; received in revised form 10 January 2007; accepted 17 January 2007

Abstract

Background: The occurrence of workplace violence is rather frequent within the nursing profession, with well-known consequences on the psychological health of victims.
Objectives: This study is aimed at assessing the relationships between relevant individual, organizational, and psychosocial factors, and the frequency of several types of workplace violence; the direct as well as the interactive impact of violence and psychosocial factors on organizational commitment and perceived health.
Design: Questionnaire-based cross-sectional and longitudinal survey designs were employed for the two study objectives, respectively.
Setting: Five hundred and sixty-five healthcare institutions from eight European countries participated in the Nurses' Early Exit Study.
Participants: The 34,107 participants were nursing staff holding different qualifications. The response rate was 55.1% in the cross-sectional part and 40.5% in the follow-up phase. At baseline, the respondents were mostly female (89.3%), in the age group 30–44 years (52.9%), registered or specialized nurses (67.0%), working mainly in medico-surgical wards (36.3%), and employed full-time (72.8%).
Methods: In the cross-sectional analysis, the relationship between the predictor variables and frequency of violence was assessed by means of a hierarchical multiple linear regression. In the longitudinal analysis, main direct and interactive effects of violence and psychosocial factors on perceived health and organizational commitment were assessed by means of hierarchical multiple linear regression analyses with interaction terms.
Results: Higher levels of adverse work-related factors were significantly associated with higher frequency of the distinguished types of violence. Significant interactions were found between psychosocial factors and violence only in predicting organizational commitment, even if effect sizes were very low. No interactions were observed for perceived health. The prevalence of the distinguished types of violence varied across the participating countries according to the presence of adverse work- and non-work-related factors.

*Corresponding author. Department of Occupational Health, University of Milan, Milan, Italy. Tel.: +39 02 503 20 159; fax: +39 02 503 20 150.
E-mail address: donatella.camerino@unimi.it (D. Camerino).

0020-7489/$ - see front matter
doi:10.1016/j.ijnurstu.2007.01.013

Conclusions: These findings suggest the necessity of interventions both over working conditions conducive to violence and violent behaviours themselves.

Keywords: Workplace violence; Nursing; Work-related factors; Organizational commitment; Perceived health; Teamwork

What is already known about the topic?

- The risk of workplace violence in nursing is higher compared to other occupations.
- Individual, organizational, and psychosocial factors are related to the risk of workplace violence.
- Workplace violence harms both the individual and the institutions.

What this Paper adds

- Cross-cultural comparative analysis indicated that prevalence of violence varies across countries according to the presence of specific working conditions.
- Several significant interactions between psychosocial factors and different types of violence were observed in the prediction of organizational commitment.

1. Introduction

1.1. Workplace violence

1.1.1. Extent of the problem

Today, there is increased evidence that nursing staff is at such a high risk of exposure to violent behaviours in the workplace, that this is now considered to be a major occupational hazard worldwide (Rippon, 2000), Europe included (Arnetz et al., 1996; Bjorkly, 1999; Saarela and Isotalus, 1999). Moreover, research indicates that the risk of workplace violence in nursing is higher compared to other occupations, both inside and outside healthcare (Carter 2000; Lawoko et al., 2004). In most studies, observed prevalence of workplace violence (mostly non-physical) indicated that more than half of the nursing staff are generally involved in the problem. In a study by Elliot (1997), the risk of violence from patients and/or from clients was 16 times higher among healthcare workers than among other service employees. While already high and continuously increasing, observed prevalence of violence in nursing may be even underestimated owing to the so-called 'underreporting' bias (Farrell and Cubit, 2005).

1.1.2. Consequences of violence

The occurrence of workplace violence may cause damage both to the individual and the institutions. Individual nurses may incur severe psychological consequences, such as post-traumatic stress disorders (Rippon, 2000), anxiety, sleep disturbances, and loss of self-confidence, while organizations may face increased absenteeism, sick leave, property damage, decreased performance and productivity, security costs, litigation, worker's compensation, and increasing turnover rates, which are detrimental especially in current times of nursing shortage (Jackson et al., 2002). In different care situations, violent episodes of both physical and verbal nature were indeed found to increase intent to leave nursing (Ito et al., 2001; Sofield and Salmond, 2003). Relationships between both violence and adverse psychosocial environment on the one hand, and poor health and low commitment in nursing on the other hand are also well established (see for example Lawoko et al., 2004).

1.1.3. Definition of violence within nursing

Both the Work Health Organization and the EU Commission recommend an extended approach towards violence wherein all circumstances and forms (both psychological and physical) of its occurrence are considered (Cooper and Swanson, 2002; WHO, 1995). Workplace violence is a multifaceted problem, which may take on several forms such as verbal abuse, physical assaults, aggression, harassment, bullying, intimidation, threatening, as well as obscene behaviours. Violent acts are perpetrated against nurses from various quarters, including patients, relatives, peers, supervisors, subordinates, and other professional groups (Cooper and Swanson, 2002).

As shown in a study conducted among a large and representative sample of 6300 Minnesota nurses, most of the physical events experienced by nurses (96.8%) result from interactions with patients and/or clients (Gerberich et al., 2004), while non-physical events, like threats and verbal abuse, apart from the patients themselves, are also perpetrated by supervisors (10.4%), colleagues (10.9%), physicians (12.8%), and patients' visitors (11.0%). In some studies, the physician was found to be the main source of verbal abuse followed by patients and patients' families (Sofield and Salmond, 2003).

1.2. Factors associated to workplace violence

Literature identifies several individual, organizational, and psychosocial characteristics of the job in relation to the risk of violence at the workplace.

1.2.1. Individual characteristics

Among the individual factors, being younger and having less job experience (Nolan et al., 2001), having a lower job title (such as being an aid or a practical nurse), being in closer contact with patients, having personality traits like negative affectivity (e.g. the tendency to focus on the negative side of life experiences), using drugs or alcohol, reporting extreme fatigue, and displaying unresolved or acted upon hostility may lead to higher risks for aggression and harassment at the workplace (Cooper and Swanson, 2002; Gerberich et al., 2004). While females have been generally considered to be more subject to violence and harassment, especially of a sexual nature, the gender role in violence exposure is not clear, with literature findings being inconsistent in identifying whether males or females are more violence-prone (Lawoko et al., 2004). Violent reactions are often related to the low awareness of healthcare providers about the adequate interaction styles to be adopted during relations with patients, especially those mentally ill (Cooper and Swanson, 2002).

1.2.2. Organizational characteristics

With regard to the organization, some clinical areas were found to be at a higher risk of workplace violence. Settings like accident and emergency, psychiatry, geriatric care, and nursing homes have been recurrently found exposed to higher frequency of violent episodes, but also general care departments like medical/surgical wards and community care are increasingly reported to be vulnerable to the occurrence of harassment and aggression (Jackson et al., 2002; Whittington et al., 1996). Moreover, particular clinical areas may attract staff with specific characteristics (for instance, some areas may profit from young personnel with higher speed and endurance), which also implies different occurrence of specific organizational features.

1.2.3. Psychosocial characteristics

Among psychosocial factors, low group climate, low organizational justice (Neumann and Baron, 1998), lack of supervisory support, poor safety climate (Calabro and Baraniuk, 2003), lack of training in violence and harassment prevention and communication skills (Duxbury and Whittington, 2005), understaffing, shift work, and high workload (Whittington et al., 1996) have been found to be related to workplace violence.

Organizations wherein difficulties within the job are not discussed openly in multidisciplinary teams are more prone to forms of violence such as bullying, harassment by superiors, and sexual harassment (Randle, 2003). When there is no teambuilding policy, physicians, surgeons (Madison and Minichiello, 2001), or even senior staff nurses may take advantage of their position (Castledine, 1999). There is also some evidence which suggests that staff may internalize aggressive behaviours when their early professional experiences develop in violent environments, also indicating that violence may constitute a form of 'learned behaviour' (Lewis, 2006).

1.3. Aims of the study

The present study relies upon data from the NEXT study.[1] It was aimed firstly at evaluating the frequency of exposure to different types of workplace violence according to some organizational and psychosocial factors. The distinguished types of violence are: (1) harassment from superiors, (2) harassment from colleagues, (3) violence from patients/relatives, and (4) discrimination. Other sources of violence were not considered in the questionnaires, being violence only one of the broad set of issues covered by the NEXT. A further aim was to explore whether diverse work- and non-work-related factors may account for the heterogeneous prevalence of frequent violence found across the participating countries.

Since adverse psychosocial working conditions are rather stable and foreseeable, while violence is more episodic and uncontrollable, we hypothesize different contributions of these two factors on the decrease of commitment and perceived health. However, as the literature demonstrates that violence is not independent from the working environment, we also assume that these two factors exert a significant synergistic effect upon organizational commitment and health. Therefore, a final aim of the present study was to test the hypothesis that psychosocial factors and violence may interact and explain variance in organizational commitment and health over and above their additive effects.

2. Methods

2.1. Sample and procedure

2.1.1. Cross-sectional assessment

The present study was conducted within eight EU countries that had participated in both the baseline and the follow-up measurements of the NEXT investigation (Belgium, Germany, Finland, France, Italy, The Netherlands, Poland, and Slovakia).

Selection of institutions was conducted in each country using a stratified sampling procedure, with the aim to reflect the national distribution of nursing staff by type of institution, geographical spread, and ownership

[1] The NEXT study is a wider multi-focused investigation on the reasons related to leaving the nursing profession in Europe. For more detailed information about the NEXT study, see Hasselhorn et al. (2003). The NEXT study was approved centrally by the University of Wuppertal in Germany and also locally in the participating countries.

(public or private). Distribution of institutions was determined by means of data provided by national statistical bureaus. The samples taken from the different countries reflected to a certain extent the population distribution across several socio-demographic characteristics (Hasselhorn et al., 2003). For example, in 2002, in Italy, according to data provided by the National Nurses' Federation (Federazione Nazionale Collegi IPASVI, 2002–2003), 82% of nursing staff worked in hospitals while the remaining 18% worked in territorial services, compared to 88.6% and 11.4% in the NEXT sample, respectively; 79% were female compared to 73.6% in the NEXT sample; 29% were in the age group 20–30, 58% in the age group 31–45, and 13% in the age group 46–60, compared to 17.9%, 63.2%, and 18.9% observed in the respective age groups in the NEXT sample. Since the main purpose of the NEXT study was to evaluate reasons for exit from nursing, the number of participants to be sampled at baseline was set at 4000–8000 units in order to obtain at least 500 leavers per country according to a power analysis calculation. In the NEXT study, 'leavers' were defined as those members of the nursing staff participating in the NEXT study who left their institution within 12 months after the baseline assessment (exit may have occurred for whatever reasons, including regular retirement, redundancy, or job change). In most countries, the questionnaires were sent nominally to participants via the institution's internal mailing system. In few occasions, direct posting to the participants' home addresses was used, with a return to the research institutions by means of a prepaid envelope. The returned questionnaires only reported a code so that subjects could not be identifiable. This code allowed the researchers to match cases over the two phases of the assessment. An introductory letter attached to the questionnaire further assured each member of the staff that all data would be treated anonymously and for the study purposes only.

The first assessment was carried out between October 2002 and June 2003, depending on countries' study planning, and in each case the follow-up assessment was conducted 1 year after the baseline measurement (Hasselhorn et al., 2003). The baseline questionnaires were sent out to a total of 61,940 members of the nursing staff, of whom 34,107 responded, for an overall response rate of 55.1%. Response rates varied across the participating countries from 41.3% to 76.9%. The baseline sample was composed mainly of nursing staff who were female (89.3%), registered or specialized nurses, i.e. nurses with post-basic training specialization under a sectorial nurse directive or post-registration nurses (67.0%), in the age group 30–44 years (52.9%), coming from the same region of employment (61.0%), and working mainly in medical/surgical wards (36.3%). The majority of respondents worked full-time (72.8%), and 50.2% of them was involved in night work (see Table 1).

2.1.2. Longitudinal assessment

Twelve months after the baseline assessment, all nursing staff employed at the institutions which took part in the first assessment were invited by the research team, regardless of their participation in the baseline phase of the study, to fill in a second questionnaire, which was a slightly modified version of the baseline instrument. Out of the 34,107 respondents to the baseline questionnaire, 13,820 also participated to the follow-up assessment, for an overall response rate at follow-up of 40.5%. It should be noted that the attrition rate (i.e. rate of drop-outs) is somewhat overestimated, since it included both non-respondents and nursing staff who left the institution during the 1-year follow-up ($N = 4949$). Attrition rates differed by country (ranging from 30.7% to 80.7%), with The Netherlands, France, and Slovakia exhibiting a higher prevalence of drop-outs.

Following procedures recommended by Twisk (2003), several logistic regression analyses were conducted to test if those who did not participate (drop-outs) in the follow-up phase differed with regards to the baseline study variables from those who participated. The results showed that there were significantly more drop-outs among those who, at baseline, declared being more highly exposed to all factors associated to violence, less highly exposed to uncertainty concerning patients' treatment (see the section on instruments), and among those who reported lower health and commitment to the organization. Moreover, drop-outs were significantly younger, were relatively more often foreigners, did more shiftwork (both with and without night shifts), and were more likely to work part-time.

2.2. Instruments

2.2.1. Measures of workplace factors

Interpersonal relationships were measured by means of a five-item scale developed by the NEXT Study group (Kümmerling et al., 2003), assessing the extent to which nurses have friendly and relaxed relations at their workplace with the nursing management, the sister/charge nurse, colleagues, doctors, and the administration. The items are to be answered on a five-point rating scale ranging from 'hostile and tense' to 'friendly and relaxed'. Cronbach's alpha was .72 in the present study.

Uncertainty concerning patients' treatment refers to poor coping skills due to the lack of attention devoted to staff training and support. It was assessed by means of a five-item scale taken from the Nursing Stress Scale by Gray-Toft and Anderson (1981). The scale evaluates the extent to which a nurse is stressed by common situations occurring in the work setting. An item example is: 'How

Table 1
Frequency of different types of workplace violence ('monthly' and 'weekly' and 'daily') by socio-demographic and work factors

		Sample		Harassment by superior		Harassment by colleagues		Violence from patients/ relatives		Discrimination	
		N	%	*N*	%	*N*	%	*N*	%	*N*	%
Country	Belgium	4134	12.1	231	5.7	165	4.0	948	23.3	111	2.7
	Germany	3508	10.3	389	11.2	299	8.6	972	28.0	194	5.6
	Finland	3868	11.3	158	4.1	144	3.7	762	19.8	48	1.2
	France	5365	15.7	573	10.8	353	6.6	2071	39.1	317	6.0
	Italy	5541	16.2	379	7.0	300	5.6	1059	19.9	169	3.2
	Poland	4354	12.8	764	18.0	520	12.3	810	19.2	80	1.9
	Slovakia	3361	9.9	180	5.6	85	2.6	542	17.0	135	4.2
	The Netherlands	3976	11.7	50	1.3	50	1.3	411	10.4	141	3.6
Gender	Female	30,342	89.3	2410	8.1	1698	5.7	6540	22.0	1016	3.4
	Male	3628	10.7	306	8.6	210	5.9	1010	28.4	178	5.0
Age	<30	6161	18.3	537	8.8	385	6.3	1712	28.2	275	4.5
	30–44	17,838	52.9	1506	8.6	1008	5.7	4027	22.9	636	3.6
	⩾45	9700	28.8	647	6.8	490	5.2	1757	18.7	278	2.9
Location of birth	Same area where I work	20,699	61.0	1672	8.2	1105	5.4	4402	21.8	643	3.2
	Other part of this country	11,668	34.4	909	7.9	704	6.1	2758	24.1	427	3.7
	Another country	1571	4.6	131	8.4	102	6.6	385	24.9	121	7.8
Occupational position	Registered or specialized nurses	22,866	67.0	1611	7.1	1168	5.2	4999	22.3	815	3.6
	Head nurses	3634	10.7	337	9.4	236	6.6	751	21.3	92	2.6
	Nursing aids or less qualified	7607	22.3	776	10.5	512	6.9	1825	24.7	288	3.9
Clinical settings	Day hospital, home care and out-patient care	3627	10.7	246	7.0	195	5.6	376	10.8	92	2.6
	Paediatric gynaecologic and obstetric wards	5592	16.5	287	5.2	199	3.6	976	17.8	127	2.3
	Intensive care unit operating rooms	6099	18.0	599	9.9	447	7.4	1259	21.0	191	3.2
	Emergency	1546	4.6	110	7.2	78	5.1	660	43.2	135	8.9
	Medical/surgical wards	7068	20.9	661	9.5	429	6.2	1693	24.4	261	3.8
	Geriatric wards long-term care	3081	9.1	306	10.1	213	7.0	906	30.0	123	4.1
	Psychiatric wards	1634	4.8	110	6.9	80	5.0	760	47.7	87	5.4
	Others	5198	15.4	386	7.6	261	5.1	885	17.6	171	3.4
Shortage of nurses at the worksite	No	22,432	66.8	1646	7.5	1176	5.3	4698	21.4	678	3.1
	Yes	11,145	33.2	1042	9.5	721	6.6	2790	25.5	506	4.6
Work schedule	Day work (regular hours)	5517	16.5	321	5.9	267	4.9	670	12.5	126	2.3
	Day work (others)	1783	5.3	135	7.7	93	5.3	284	16.2	64	3.6
	Only night shift	1324	4.0	82	6.3	61	4.6	448	34.1	78	5.9
	Shift work without nights	9345	28.0	767	8.3	585	6.4	2159	23.6	318	3.5
	Shift work with nights	15,441	46.2	1372	9.0	879	5.8	3926	25.8	591	3.9
Employment contract	<35 h	8637	27.2	351	4.1	290	3.4	1396	16.4	253	3.0
	⩾35 h	23,135	72.8	2207	9.7	1488	6.6	5611	24.8	844	3.7

Total case number may change for each factor owing to different numbers of missing values.

often do you feel stressed by uncertainty regarding the operation and functioning of specialized equipment?'. Cronbach's alpha was .73.

Role conflict and role ambiguity were measured by means of a four-item scale developed by the NEXT Study group in order to assess the extent to which nurses

lack sufficient information about tasks to accomplished, or have to do things not suited to their professional role. An item example for role conflict is: 'If you think of a typical working day, do you, in your opinion, perform tasks which do not belong to your profession?', which is answered by means of a three-point scale ranging from 'no, never' to 'yes, more than 20% of my working time'. For role ambiguity, an item example is: 'How often do you receive information, which is relevant to your work, insufficiently or too late?', and is answered by means of a five-point scale ranging from 'never' to 'constantly'. The Cronbach's alpha for the role conflict and role ambiguity scale was .69.

Time pressure was measured by means of a five-item scale from the Copenhagen Psychosocial Questionnaire (Kristensen, 2000). This scale evaluates the extent to which nurses lack time to accomplish tasks, or have to work at high pace. An item example is: 'Do you have to work very fast?', with answering categories ranging from 'hardly ever' to 'always'. Cronbach's alpha was .70.

The scales 'interpersonal relationships', 'uncertainty concerning patients' treatment', 'role conflict and role ambiguity',[2] and 'time pressure' were computed as the mean across the individual items, with scores ranging from 1 to 5 (higher scores indicate higher levels of exposure). For all these scales, except for 'interpersonal relationship', one missing item was tolerated for scale computation, with the missing item replaced by the mean obtained over the valid values.

Lifting and bending is a eight-item scale measuring cumulative physical exposure developed by the NEXT Study group in order to quantify the specific lifting and bending within the nursing profession. The respondents were requested to answer on a four-point rating scale how frequently they are exposed to different physical tasks implying lifting and bending postures. The answer categories were '0–1 times a day', '2–5 times a day', '6–10 times a day', and 'more than 10 times a day'. Scores range from 0 to 100, with higher scores indicating higher exposure.[3] Cronbach's alpha was .88.

Satisfaction with working time was assessed by means of a single-item: 'All in all, are you satisfied with your working time, in relation to your well-being?', using a dichotomous response format ('yes' or 'no').

2.2.2. Assessment of violence

Different types of violence were assessed using single-item measures developed by the NEXT Study group. The participants were asked how often at work they were generally subject to harassment (1) by superiors and (2) by colleagues, (3) to violence from patients/relatives, and (4) to discrimination (e.g. sexual, racial, political, religious, etc.). The items were answered on a five-point rating scale ranging from 'never' to 'daily'. An item example is: 'At you workplace, are you subject to harassment by your superior?'. Single items were used since exposure to a particular type of violence does not necessarily imply exposure to other types of violence. This may also explain the rather low-scale reliability if we aggregate the separate items (Cronbach's alpha was .57). For this reason, a total harassment score was not used in the present study. In the cross-sectional part of the study, all variables assessing violence have been dichotomized to show percentages using the 'never' and 'seldom' categories to indicate (1) 'no frequent violence', and the categories 'monthly', 'weekly', and 'daily' to indicate (2) 'frequent violence'.

2.2.3. Measures of the dependents

Organizational commitment was measured by means of a four-item scale adapted from Allen and Meyer (1990). All items reflected the affective dimension of commitment. An item example is: 'I really feel that I belong to this institution'. Items were answered on a five-point rating scale ranging from 'totally inaccurate' to 'totally accurate'. Score for this scale ranges from 1 to 5, with higher scores indicating higher organizational commitment. Cronbach's alpha was .78. The Intra-Class Correlation (ICC) coefficient was calculated for assessing test–retest reliability, obtaining a score of .59 ($p < .001$).

Perceived health was measured using a five-item scale from the Copenhagen Psychosocial Questionnaire (Kristensen, 2000), which is originally based on the SF-36 scale (Ware and Sherbourne, 1992). Items are answered on a five-point scale ranging from 'definitely false' to 'definitely true'. Score for this scale was set from 0 to 100 following the proposals of the authors, with higher scores indicating higher perceived health[4]. Cronbach's alpha was .75. Test–retest reliability was satisfactory, as indicated by an ICC coefficient of .62 ($p < .001$).

[2]For the 'Role conflict and role ambiguity' scale, a score of 5 could be obtained in those cases where the scale item with three answer categories was replaced by the mean calculated over the other items, when each of these had a score of 5. This was the case for 296 subjects, corresponding to .9% of the total sample having valid values on this scale.

[3]The 'lifting and bending' scale has been constructed as a weighted sum score, with each weight being equivalent to the median of exposure times in each of the answer category (weights were 1 = 0; 2 = 3.5; 3 = 8; 4 = 15). The final score for each subject was then computed according to the following formula: ($\sum$lifting and bending items/6×5), in order to obtain a final score ranging from 0 to 100.

[4]The total score of the 'perceived health' scale was obtained according to the following formula: 100[($\sum$perceived health items)−1]/4, in order to obtain a final score ranging from 0 to 100.

2.2.4. Assessment of confounders

On the basis of the reviewed literature, country, age, gender, location of birth, occupational position, clinical settings, nursing shortage at the worksite, work schedule, and type of employment contract were included as confounders in the analyses in order to adjust for their possible associations with the variables under study. For a full depiction, see Table 2.

2.3. Statistical analyses

2.3.1. Cross-sectional analysis

The association between each type of workplace violence separately and work-related factors (satisfaction with working time, interpersonal relationships, uncertainty concerning patients' treatment, role conflict and role ambiguity, time pressure, and lifting and bending) has been tested using hierarchical linear regression analysis. In Model 1, only the confounders were included, and the organizational and psychosocial factors were subsequently entered in Model 2. Explained variance and its significance was calculated for each of the two models. In the multivariate analysis, we included only those factors that were found to be significantly associated with violence in a series of univariate linear regression analyses (not reported).

2.3.2. Longitudinal analysis

For each dependent variable separately (organizational commitment and perceived health both measured at Time 2), several hierarchical regression models have been conducted in order to test interactions between each type of violence and each psychosocial factor measured at Time 1 (e.g. harassment by superiors × interpersonal relationships), resulting in a total of $5 \times 4 \times 2 = 40$ regression models tested. Computing of interaction terms and significance of their effects on the outcomes were tested following the procedure suggested by Aiken and West (1991). In the analyses, predictors have been entered into the regression model in four sequential steps. In the first step (Model 1), only the confounders measured at Time 1 were included. In Model 2, we added the Time 1 outcome measure. In Model 3, each violence measure and each psychosocial factor measured at Time 1 were then entered separately. In the fourth and last step (Model 4), the interaction term was added to the model. Differences in explained variance (ΔR^2), and their tests of significance were calculated in order to assess the relative contribution of the specific groups of variables included in each sequential step. Finally, significance of simple slopes and direction of interactions were assessed by means of plots again following the procedure provided by Aiken and West (1991). For illustrative purposes, only one graphical representation of interaction has been displayed in this article (see Fig. 1). All analyses have

Table 2
Hierarchical linear regression for the associations between work-related factors and different types of workplace violence

	Harassment by superior			Harassment by colleagues			Violence from patients/ relatives			Discrimination		
	β	R^2	ΔR^2	β	ΔR^2	ΔF	β	ΔR^2	ΔF	β	ΔR^2	ΔF
Model 1 (all confounders)		.10	.10***		.09	.09***		.12	.12***		.05	.05***
Model 2 (all predictors)		.22	.12***		.17	.08***		.22	.10***		.10	.05***
Dissatisfaction with working time	.05***			.03***			.05***			.03***		
Uncertainty concerning patients' treatment	.05***			.04***			.12***			.08***		
Interpersonal relationships	−.24***			−.22***			−.04***			−.10***		
Role conflicts and role ambiguity	.11***			.09***			.11***			.10***		
Lifting and bending	.02*			.001			.15***			.03***		
Time pressure	.06***			.02**			.08***			.02**		

Case number may change in the four multivariate analyses owing to different numbers of missing values.
Confounders: country, gender, age, location of birth, occupational position, clinical setting, work shifts, and work hours.
F-test for significance of change in R^2 = *<.05, **<.01, ***<.001.

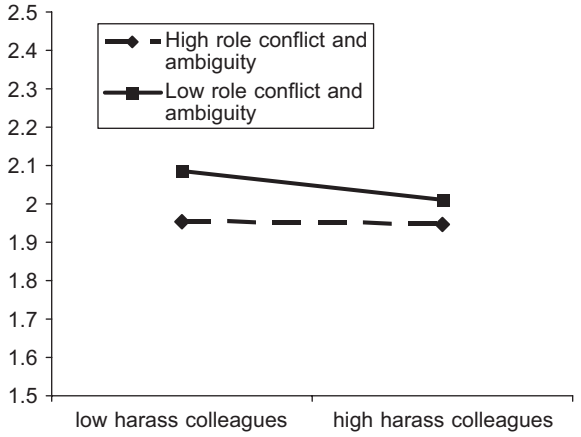

Fig. 1. Interaction effect of role conflict/ambiguity (Time 1) and harassment from colleagues (Time 2) upon organizational commitment.

been conducted using the statistical package SPSS 14.0 (SPSS, Inc., Chicago, Illinois, USA).

3. Results

3.1. Cross-sectional analysis

3.1.1. Workplace violence according to socio-demographic and work-related factors

Overall, in our European sample, the highest prevalence for frequent exposure ('monthly' + 'weekly' + ' daily') was found for violence by patients/relatives (22.7%), followed by harassment from superiors (8.1%), harassment from colleagues (5.7%), and discrimination (3.6%). A full depiction of prevalence of workplace violence according to socio-demographic and work-related factors is shown in Table 1. Violence from patients and relatives was the most reported violence-related problem in all participating countries, with France displaying the highest prevalence. Nursing staff from Poland, France, and Germany reported the highest frequency of exposure to the other types of violence. Moreover, violence from patients/relatives and discriminative behaviours were more frequently reported by male nurses in comparison with females. As a whole, younger nursing staff reported higher frequency of exposure to the various types of violence, and again, mainly from patients and relatives. As expected, nurses coming from abroad were exposed to higher frequency of discriminative behaviours. Nursing aids consistently reported slightly higher frequency of exposure to each type of violence. In psychiatric, emergency, and geriatric wards, and in long-term care, violence by patients and relatives was reported more frequently. In geriatric and medical/surgical wards, in long-term care, and in intensive care units, the frequency of harassment by both superiors and colleagues was reported to be slightly higher. As a whole, nursing staff doing shift work (including both day and night shifts, or only night shifts) were exposed to higher frequency of violent acts. Nursing staff working on a full-time basis ($\geqslant$35 h per week) were more likely exposed to frequent harassment from both superiors and colleagues, while the difference in exposure to violence from patients and relatives was not apparent. Shortage of nurses at the worksite appeared to be also associated with higher frequency of any type of violence that was distinguished in our study.

3.1.2. Association between organizational/psychosocial factors and violence

Table 2 reports the results of the multiple hierarchical linear regression model conducted to assess the associations between the four types of violence and the considered work-related factors. In Model 2, regression coefficients relating to the work-related factors are adjusted by all the control variables (Model 1). Compared to confounders, the inclusion of the work-related factors accounts for an amount of added explained variance ranging from .05 ($p<.001$) to .12 ($p<.001$) across the distinguished types of violence. Apart from the association between lifting and bending and harassment by colleagues, all tested relationships between the work-related factors and violence were significant (mostly at the $<.001$ alpha level). All associations were in the expected direction, with worse scores on the work-related factors related to higher frequency of any type of violence. The strongest relations were those between lower quality of interpersonal relationships and higher frequency of exposure to harassment from both superiors and colleagues. Higher lifting and bending and higher uncertainty concerning patient's treatment were the factors more strongly related to higher frequency of exposure to violence from patients/relatives.

3.1.3. Prevalence of risk factors for violence according to country

Table 3 displays country-related prevalence or means of those profile and work-related factors that in Table 1 were found to be associated with higher frequency of violence in the aggregated sample. As a whole, Germany, France, and Slovakia reported comparably higher prevalence for many of the factors associated to higher frequency of violence. Interestingly, while Germany and France were also found to have the highest frequency along the different types of violence, the same cannot be said for Slovakia, which reported comparably low prevalence of violence, although it had many adverse conditions which were associated to frequent occurrence of violence in the whole sample. On the other hand, in Finland and The Netherlands,

where frequency of violence was the lowest, also the prevalence of risk factors was found to be the lowest.

3.2. Longitudinal analysis

Table 4 reports the adjusted regression coefficients of both main (Model 3) and interactive effects (Model 4) of violence and psychosocial factors on organizational commitment and perceived health. In the table, regression coefficients for Models 1 and 2 are reported only once being constant across the several models.

As a whole, the control variables in Model 1 accounted for 15.0% of the variance of Time-2 organizational commitment and 10.0% of the variance of Time-2 perceived health. An additional amount of variance (26.0% and 32.0%) in the two outcomes measured at Time 2 was explained by the respective outcomes measured at Time 1, accounting for a fair degree of stability over time. The rate of added variance explained in the several regression models by the inclusion of the work-related factors (main effects) was significant, though of rather low size. An even lower amount of additional variance in the study outcomes was related to the inclusion of the interactive terms.

For the main effects, lower organizational commitment was significantly related to worse scores on all violence-related and psychosocial factors, with the exception of harassment from superiors and harassment from colleagues when are in the regression models along with interpersonal relationships (non-significant relationship). The following interaction terms significantly predicted *organizational commitment*:

- Harassment from superiors × Interpersonal relationships;
- Harassment from superiors × Uncertainty concerning patients' treatment;
- Harassment from colleagues × Uncertainty concerning patients' treatment;
- Harassment from colleagues × Role conflict and ambiguity;
- Harassment from colleagues × Time pressure;
- Violence from patients and relatives × Time pressure;
- Discrimination × Time pressure.

Graphical representation of interactions showed that in almost all cases the regression coefficients of organizational commitment upon the different types of workplace violence were only significant among nursing staff reporting better Time-1 values along the four psychosocial factors. For example, Fig. 1 shows that among nursing staff reporting low role conflict and ambiguity at baseline, the negative effect of harassment from colleagues upon organizational commitment was higher. On the contrary, for nursing staff reporting high role conflict and ambiguity at baseline, no changes of organizational commitment that could be attributed to harassment from colleagues was observed.

Only higher harassment from colleagues were related to decreased perceived health, but again effect sizes were rather low. No significant interactions were found for perceived health.

4. Discussion

4.1. Cross-sectional part of the study

Our study has the main advantage of relying upon a wide European sample. Sample distribution of profiles such as nursing staff's gender, age, and qualifications sufficiently reflects relative distribution in each country. However, nursing aids remained underrepresented in those countries where, according to specific national legislations, they were not regarded in any of the nurses' professional categories (e.g. in Italy).

Results of our study concerning the prevalence of violence are not fully comparable with other studies conducted on this topic, since we assessed only general frequency of exposure, while most previous research evaluated whether a nurse has experienced some form of violence or the number of episodes that occurred during a specific time span (Gerberich et al., 2004; Cooper and Swanson, 2002). Still, our findings show that in Europe violence in nursing is a problem worth investigating, particularly in relation to the organizational and psychosocial factors contributing to its occurrence. In particular, frequency of violence by patients/relatives came out as the major hazard.

Higher uncertainty concerning patients' treatment was associated with higher frequency of harassment from superiors. A possible explanation for this is that when nurses are assigned tasks for which they feel insecure, they may interpret such assignments as misbehaviours (harassment) by superiors. Furthermore, the work environment might lack sufficient and effective flow of information to be used by nurses about their clinical tasks, and this might add to the probability of failures, mainly when nurses are inexperienced and thus unable to offset poor communication by their previously acquired clinical and technical skills and competencies. Not knowing exactly what to do in clinical circumstances may obviously undermine the quality of relationships with patients and relatives, possibly resulting in higher frequency of violence by patients and their family. Moreover, when nurses feel disorientated about what to do during their job they may also become more prone to harassment by colleagues and discriminatory behaviours by the others.

The assumption that a work environment characterized by poor information flow (not only in relation to

Table 3
Prevalence by country of profile variables associated to "violence"; mean and standard deviations by country of working conditions and psychosocial factors associated to "violence"

Variable	Label	Belgium	Germany	Finland	France	Italy	The Netherlands	Poland	Slovakia
Percentage									
Gender	% male	8.6	16.4	4.9	11.2	25.9	9.3	1.0	2.4
Age	% <30	25.0	21.4	12.8	19.8	13.2	23.0	13.7	19.3
Location of birth	% another country	6.6	10.0	1.7	5.9	4.7	5.2	.4	2.7
Occupation position	% nursing aids or less qualified	11.0	9.4	5.1	38.1	3.2	10.8	53.9	48.6
Clinical settings	Emergency	8.8	3.7	7.6	4.9	4.3	2.7	1.1	3.4
	Geriatric wards and long term care	0	21.7	0	15.2	3.6	12.6	5.3	18.0
	Psychiatric wards	4.3	5.2	2.0	13.2	2.7	1.5	1.4	6.9
Work schedule	Only night	4.7	6.7	2.4	13.9	.1	1.7	0	.1
	Shift work with night	27.7	44	53.5	15.7	55.9	54.0	63.3	65.5
Employment contract	Full time	46.5	59.1	88.4	83.4	90.7	22.1	98.5	87.6
Satisfaction with working time	No	22.2	33.8	27.6	30.6	33.3	13.1	32.2	35.6
Mean (SD)									
Uncertainty concerning patients' treatment		34.3(18.4)	35.7(19.7)	30.6 (17.0)	34.1(17.3)	33.0(20.7)	27.0(14.9)	33.8(22.4)	23.3(18.8)
Interpersonal relationships		68.3(15.4)	65.8(15.7)	62.4(14.9)	58.1(16.6)	56.2(17.8)	67.6(13.6)	60.9(18.3)	67.3(19.1)
Role conflicts and role ambiguity		2.1(.7)	2.4(.8)	2.1(.6)	2.4(.8)	2.6(.9)	1.9(.6)	2.2(.9)	2.5(.9)
Lifting and bending		29.8(20.0)	28.8(20.3)	25.4(25.7)	25.5(23.4	22.2(21.7)	26.2(20.6)	26.9(23.3)	24.3(22.3)
Time pressure		58.5(15.3)	61.9(16.2)	59.6(14.3)	56.1(17.0	58.6(17.0)	51.6(14.2)	62.4(16.4)	62.1(14.2)

Table 4
Multiple linear regression analysis for assessing the interaction between different types of workplace violence and psychosocial factors on nurses' organizational commitment and perceived health

Model		Organizational commitment			Perceived health		
		β	R^2	ΔR^2	β	R^2	ΔR^2
1	Confounders		.15	.15***		.10	.10***
2	Outcome Time 1	.55***	.40	.26***		.42	.32***
3	Harassment from superiors	−.008	.41	.006***	−.006	.42	.001***
	Interpersonal relationships	.009***			.03**		
4	Harassment from superiors × interpersonal relationships	−.02*		.0003*	−.008		.0006
3	Harassment from superiors	−.02**	.41	.002***	−.008	.42	.001***
	Uncertainty concerning patients' treatment	−.04***			−.03***		
4	Harassment from superiors × Uncertainty concerning patients' treatment	.01*		.0003*	.009		.0001
3	Harassment from superiors	−.02**	.41	.003***	−.007	.42	.001***
	Role conflict and ambiguity	−.05***			−.03***		
4	Harassment from superiors × Role conflict and ambiguity	.01		.0002 *	.008		.0007
3	Harassment from superiors	−.03***	.41	.001***	−.007	.42	.001***
	Time pressure	−.02**			−.04***		
4	Harassment from superiors × Time pressure	.01		.0001	.005		.0002
3	Harassment from colleagues	−.005	.41	.006***	−.02*	.42	.001***
	Interpersonal relationships	.09***			.02**		
4	Harassment from colleagues × interpersonal relationships	−.004		.0001	−.005		.0003
3	Harassment from colleagues	−.02**	.41	.002***	−.02*	.42	.001***
	Uncertainty concerning patients' treatment	−.04***			−.03***		
4	Harassment from colleagues × Uncertainty concerning patients' treatment	.02***		.001***	.008		.0007
3	Harassment from colleagues	−.02*	.41	.003***	−.02*	.42	.001***
	Role conflict and ambiguity	−.06***			−.03***		
4	Harassment from colleagues × Role conflict and ambiguity	.02**		.009**	.003		.0001
3	Harassment from colleagues	−.02**	.41	.001***	−.02**	.43	.002***
	Time pressure	−.02**			−.04***		
4	Harassment from colleagues × Time pressure	.01*		.0002*	.007		.0005
3	Violence from patients	−.02**	.41	.007***	−.01	.42	.001***
	Interpersonal relationships	.09***			.03***		
4	Violence from patients × interpersonal relationships	.001		.0001	−.009		.0009
3	Violence from patients	−.02**	.41	.002***	−.009	.42	.001***
	Uncertainty concerning patients' treatment	−.04***			−.03***		
4	Violence from patients × Uncertainty concerning patients' treatment	.01		.0001	.006		.0004
3	Violence from patients	−.02**	.41	.003***	−.009	.42	.001***
	Role conflict and ambiguity	−.05***			−.03***		
4	Violence from patients × Role conflict and ambiguity	.01		.0001	.009		.0008
3	Violence from patients	−.03***	.41	.001***	−.009	.43	.001***
	Time pressure	−.02**			−.04***		

Table 4 (*continued*)

Model		Organizational commitment			Perceived health		
		β	R^2	ΔR^2	β	R^2	ΔR^2
4	Violence from patients × Time pressure	.02*		.0002*	.001		.00002
3	Discrimination	−.02**	.41	.007***	−.01	.42	.001***
	Interpersonal relationships	.09***			.03***		
4	Discrimination × interpersonal relationships	.001		.0001	−.009		.0009
3	Discrimination	−.02**	.41	.002***	−.009	.42	.001***
	Uncertainty concerning patients' treatment	−.04***			−.03***		
4	Discrimination × Uncertainty concerning patients' treatment	.01		.0001*	.006		.0004
3	Discrimination	−.02**	.41	.003***	−.009	.42	.001***
	Role conflict and ambiguity	−.05***			−.03***		
4	Discrimination × Role conflict and ambiguity	.01		.0001	.009		.0008
3	Discrimination	−.03***	.41	.001***	−.009	.43	.001***
	Time pressure	−.02**			−.04***		
4	Discrimination × Time pressure	.02*		.0002**	.001		.0002

Case number may change in the four multivariate analyses owing to different numbers of missing values.
All regression coefficients adjusted for country, gender, age, location of birth, occupational position, clinical setting, work shifts, and work hours.
Regression coefficients for Models 1 and 2 are constant across all analyses.
* < .05; ** < .01; *** < .001.

clinical issues) might be related to higher frequency of violence was confirmed by the significant associations found in our study between role conflict and role ambiguity and all the different forms of workplace violence considered. When nurses are involved in job requests, which are ill-suited to their professional role, they may either miss quality of performance being not skilled enough to do off-role tasks properly, or they may hesitate and avoid compliance with the requests posed on them.

As expected, poor interpersonal relationships appeared to be the psychosocial factor more strongly related to high harassment by both superiors and colleagues. While it is obvious that interpersonal relationships worsen along with nurses' experiences of staff-to-staff harassment, it may also be argued that a social environment, which is generally bad, leads to more frequent occurrences of harassment. While our analysis confirmed this second possibility, the cross-sectional design cannot adequately ascertain the direction of the relationship, which can also be of a reciprocal nature. The two concepts of harassment and interpersonal relationships may also be partly overlapping, since experienced violence is closely embedded in the feeling of a poor social environment at the workplace. Interestingly, in our data, poor interpersonal relationships were also found related to more violent behaviours by the patients and their relatives. Hostile interactions with various organizational actors have been previously found to worsen the organizational climate, which is in turn related to poorer collaboration and higher feelings of personal distress (Cole et al., 1997). In a downward spiral, these may jeopardize relationships with patients and their relatives, and elicit negative reactions such as violence.

Nursing staff doing more physical tasks are exposed to higher frequency of violent acts from patients, since most of time this implies higher contact occasions with the others. On the contrary, a higher physical workload seems to be protective against harassment from colleagues: a possible explanation for this is that doing physical activity may be interpreted by co-workers as a way to be collaborative.

In our study, a higher time pressure was related to a higher frequency of harassment by superiors and violence by patients/relatives. Other studies have found that increases in workload, which are related to low nurse-to-patient ratio caused by nursing shortage and decreased patients' length of stay, may lead to violence from patients since the latter may feel that nurses lack time to provide adequate care. When confronted with high time pressure, nursing staff are more likely to report higher harassment by superiors as well, since pressure posed on the worker may be viewed as a discriminatory act perpetrated by supervisors, or a reaction by the supervisor to the difficulty of the nursing staff to cope with work requests, whether these are adequate or not. Indeed, the supervisor, in certain

organizations, is liable for the results but cannot rise his/her voice about adequate nurse/patient ratios.

Unsatisfactory working time was related to higher frequency of all types of considered violence. It can be argued that much hostility surrounds the planning of time schedules and that such hostility may translate in worsened interactions with patients and their relatives.

As a whole, there is a lack of research performing cross-cultural comparisons of workplace violence. Our findings suggest that there are specific structural and working conditions facilitating the occurrence and frequency of violence in different countries. For example, Poland, where frequency of violence from superiors and colleagues was among the highest, also had the highest number of low-qualified nursing staff, characterized by relatively high uncertainty concerning patients' treatment, high-pace working, and a non-supportive social environment.

4.2. Longitudinal part of the study

Most regression analyses indicated that higher frequency of the different types of violence and adverse psychosocial factors independently predict lower organizational commitment. In some cases, also the interaction between violence and psychosocial factors appeared to significantly predict organizational commitment. In particular, the adverse effects of violence upon organizational commitment were higher for nursing staff reporting positive compared to the staff reporting negative psychosocial conditions at baseline. An explanation for this finding could be that when working conditions are perceived as being already adverse, the occurrence of workplace violence may add a little to the decrease of nurses' organizational commitment. This situation resembles the main assumption of the so-called 'Vitamin model', which states that job-related well-being may be harmed by negative job characteristics, but when a certain level is reached, the effect stabilizes (De Jonge and Schaufeli, 1998). It might also be that when a nurse perceives positive psychosocial working conditions, harassment from both superiors and colleagues, violence from patients/relatives, and discrimination could initially engender disillusionment and thus decreased commitment, mostly before one understands the situation and learns how to deal with it in a proper way.

In our 1-year interval longitudinal study, the main effects of the different types of violence upon perceived health were not significant, even though previous literature exhibited a widespread evidence of negative feelings and reactions triggered by experienced violence (Rippon, 2000; Lawoko et al., 2004). One may explain this by assuming that perhaps nursing staff is more able to cope with violence after-effects compared with other professionals. Yet, our instruments do not allow us to measure such coping abilities, nor to ascertain if any restoring mechanisms are in place at the organizational level to deal with violence-related consequences, or to implement preventive measures. Moreover, the scale used in our study to measure general health perception was not focused enough to detect specific emotional reactions occurring after exposure to violence. It might be that more specific effects on both the psychological and the physical spheres of health are likely to be found in case more elaborated health measures were used.

Unlike violence, the main effects of psychosocial factors upon health proved to be significant, confirming previous findings (McVicar, 2003), though interaction effects between the different types of violence and psychosocial factors have not been found. The absence of main significant effects of the different types of violence upon general health could have considerably lowered the probability of detecting significant interactions.

4.3. Study limitations

The main limitation of our study is related to the high attrition rate, which may have biased the results of the longitudinal analysis. Such a selection bias may have occurred in our sample since loss of cases at follow-up was found to be related to both the baseline covariates (violence-related and psychosocial factors) and the outcomes (organizational commitment and perceived health). In particular, when losses are overrepresented among those with higher exposure and lower health at baseline, effect sizes may result in a downward bias (Cheung, 2001). In our study, this means that the regression coefficients of violence and psychosocial factors on organizational commitment and perceived health might have been higher had the attrition been non-selective. Moreover, the problem of selection bias may be also worsened by differential attrition rates across countries: as a consequence, the results might be more representative of those countries with lower rates of drop-outs. Owing to available data, we were not able to perform a sensitivity analysis, as suggested by Rothman and Greenland (1998), to quantitatively determine the magnitude of selection bias occurred in both the aggregated and the countries' samples. Unfortunately, financial constraints hindered the planning of repeated posting of questionnaires to non-responders or further advertisement to maintain nursing staff's compliance into the study. Cultural differences may also have played a role in the unequal feedback to the study given by nursing staff coming from the different countries.

A second limitation of our study lies in the way violence has been assessed. The types of violence considered were not differentiated as to their severity. It might be that nursing staff only reported severe violence episodes, thus underestimating frequency of

exposure. Thirdly, we were not able to distinguish whether responsibility for violence occurrence was attributed by the nursing staff to themselves, to patient's typology, to personal features of perpetrators, or to the organization as a whole. A fourth limitation is related to the cross-sectional design of the first part of this study, which prevents us from drawing any conclusion about direction of causal effects between work-related factors and occurrence of violence.

A final limitation is represented by the low effect sizes observed in the longitudinal part of the study. However, Zapf and Leymann (1996) argue that in longitudinal studies effects are expected to be low since stability of outcome over time considerably reduces variance which may be explained by the predictors in the study. It may also be that time lags (which may be either too short or too long) are inappropriate to detect significant or higher effects of predictors upon outcomes (Zapf and Leymann, 1996). Interaction terms appeared to be able to explain only a limited amount of variance in the outcomes. However, it has been previously noted that effect sizes of interaction terms are generally low, usually corresponding to an increase of R^2 of .02 or even smaller (Bakker et al., 2005; Frazier et al., 2004).

4.4. Study implications

Our study mainly suggests that psychosocial working conditions and violence have an independent negative impact upon nurses' commitment to their organization. Accordingly, interventions should focus on both psychosocial environment and violence, meaning that either primary (aimed at reducing or eliminating adverse psychosocial factors before violence occurs) or secondary (aimed at intervening at the occurrence of workplace violent episodes) preventive measures have to be undertaken. Several recent intervention studies focused on the necessity of multidisciplinary team-oriented personnel safety training in the prevention of workplace violence (Privitera et al., 2005; Sarnese, 1995).

All these studies also highlighted that violence occurs during human interactions, and that all organizational aspects harming optimal management of interaction may provoke violence and harassment. Hence, a particular working team as a whole should revise work procedures and environments in order to avoid such circumstances in which poor interactions and/or poor communication and resulting violence acts may occur.

Alexander and Fraser (2004) also suggested that management strategies addressing occupational violence in the healthcare sector need to be comprehensive and multidisciplinary in scope. Their study shows that increased quality of nurse–patient relationships, and working in supportive teams are perceived as protective factors against the risk of violence. Moreover, suitable interventions may prevent new generations of nurses from being socialized in a violent culture and thus from considering such behaviours as an organizational necessity (Lewis, 2006).

Interventions aimed at increasing professional competence were shown to be effective in protecting against the occurrence of violence. In particular, training devoted to improve therapeutic skills was advocated by psychiatric patients as a way to ameliorate staff's comprehension of their non-verbal communication, and also their own perception of staff behaviour (Duxbury and Whittington, 2005; Omerov et al., 2004).

Among interventions that could be enacted to reduce psychological sequel of patients' assaults on psychiatric healthcare staff, the so-called Assaulted Staff Action Program (ASAP) demonstrated to be effective and associated with a notable decline in the assault rate at the state hospital where it was implemented (Flannery et al., 1998; Flannery, 2003). The Occupational Safety and Health Administration (OSHA, 1998) has developed guidelines for reducing workplace violence, specifically in healthcare and in social service work environments. These guidelines are intended to be advisory in nature, as well as informational in content and are aimed at assisting employers in establishing a safe workplace by creating effective violence prevention programmes. The guidelines should be used and adapted to meet the specific needs and resources of each place of employment (Roll, 1996), and support OSHA's mandate that employees are entitled to a safe and healthy workplace.

The results of our study are in line with the findings by Nelson and Cox (2004) and show that it is in the interest of administrators and their departmental heads to understand the specific dynamics that accelerate dysfunctional conflict in healthcare institutions, and to build more collaborative work cultures to minimize their effects. Even if interventions are not easily implemented and risks may not be wholly remove, joint labour management research efforts have to be developed aimed at documenting a process to reduce violence. Even though healthcare workers may be exposed to all four types of violence in the course of their work, the overwhelming majority of threats and assaults against caregivers comes from patients, justifying an emphasis on this type of violence. Individual nurses and direct care providers have very little influence over the level of violence in their workplaces, but through collective action policies designed to protect the healthcare workforce might be influenced.

Acknowledgements

The NEXT study was initiated by SALTSA (Swedish Joint Program for Working Life Research in Europe), and financed by the European Union within the 5° framework (QLK6-CT-2001-00475). The participation

of Poland and Slovakia was financed by a European Commission fund aimed at the 'newly associated states'.

References

Aiken, L.S., West, S.G., 1991. Multiple Regression: Testing and Interpreting Interactions. Sage, Newbury Park, CA.

Alexander, C., Fraser, J., 2004. Occupational violence in an Australian healthcare setting, implications for managers. Journal of Healthcare Information Management 49 (6), 377–392.

Allen, N.J., Meyer, J.P., 1990. The measurement and antecedents of affective continuance and normative commitment to the organization. Journal of Occupational Psychology 63, 1–18.

Arnetz, J.E., Arnetz, B.B., Petterson, I.L., 1996. Violence in nursing profession: occupational and lifestyle risk factors in Swedish nurses. Work and Stress 10, 119–127.

Bakker, A.B., Demerouti, E., Euwema, M.C., 2005. Job resources buffer the impact of job demands on burnout. Journal of Occupational Health Psychology 10, 170–180.

Bjorkly, S., 1999. A ten-year prospective study of aggression in a special secure unit for dangerous patients. Scandinavian Journal of Psychology 40, 57–63.

Calabro, K., Baraniuk, S., 2003. Organizational factors related to safety in a psychiatric hospital: employee perceptions. AAOHN Journal: Official Journal of the American Association of Occupational Health Nurses 51 (10), 425–432.

Carter, R., 2000. Risk of violence against nurses. Nursing Management 6 (8), 5.

Castledine, G., 1999. Sexual harassment at work. Senior staff nurse who took advantage of his position. British Journal of Nursing 8 (16), 1049.

Cheung, Y.B., 2001. Adjustment for selection bias in cohort studies: an application of a probit model with selectivity to life course epidemiology. Journal of Clinical Epidemiology 54 (12), 1238–1243.

Cole, L.L., Grubb, P.L., Sauter, S.L., Swanson, N.G., Lawless, P., 1997. Psychosocial correlates of harassment, threats and fear of violence in the workplace. Scandinavian Journal of Work, Environment and Health 23 (6), 450–457.

Cooper, C.L., Swanson, N., 2002. Workplace Violence in the Health Sector: State of the Art. ILO, Geneva.

De Jonge, J., Schaufeli, W.B., 1998. Job characteristics and employee well-being: a test of Warr's Vitamin Model in health care workers using structural equation modeling. Journal of Organizational Behavior 19, 387–407.

Duxbury, J., Whittington, R., 2005. Causes and management of patient aggression and violence, staff and patient perspectives. Journal of Advanced Nursing 50 (5), 469–478.

Elliot, P.P., 1997. Violence in health care: what nurse managers need to know. Nursing Management 28 (12), 38–41.

Farrell, G., Cubit, K., 2005. Nurses under threat, a comparison of content of 28 aggression management programs. International Journal of Mental Health Nursing 14 (1), 44–53.

Federazione Nazionale Collegi IPASVI, 2002–2003. Indagine sulla formazione universitaria degli infermieri. Rapporto 2002–2003. Available at: 〈http://www.ipasvi.it/content/osservatorio/rapp_formaz_02_03.pdf〉.

Flannery, R.B., 2003. Staff victims of elder patient abuse and the Assaulted Staff Action Program (ASAP), preliminary empirical inquiry. American Journal of Alzheimer's Disease and Other Dementias 18 (2), 93–96.

Flannery, R.B., Hanson, M.A., Penk, W.E., Goldfinger, S., Pastva, G.J., Navon, M.A., 1998. Replicated declines in assault rates after implementation of the Assaulted Staff Action Program. Psychiatric Services 49 (2), 241–243.

Frazier, P.A., Tix, A.P., Barron, K.E., 2004. Testing moderator and mediator effects in counseling psychology research. Journal of Counseling Psychology 51, 115–134.

Gerberich, S.G., Church, T.R., McGovern, P.M., Hansen, H.E., Nachreiner, N.M., Geisser, M.S., Ryan, A.D., Mongin, S.J., Watt, G.D., 2004. An epidemiological study of the magnitude and consequences of work related violence: the Minnesota Nurses' Study. Occupational and Environmental Medicine 61 (6), 495–503.

Gray-Toft, P., Anderson, J.G., 1981. The Nursing Stress Scale: development of an instrument. Journal of Behavioral Assessment 3, 11–23.

Hasselhorn, H.M., Tackenberg, P., Mueller, B., 2003. Working conditions and intent to leave the profession among nursing staff in Europe. Working Life Research Report 7, National Institute for Working Life, Stockholm.

Ito, H., Eisen, S.V., Sederer, L.I., Yamada, O., Tachimori, H., 2001. Factors affecting psychiatric nurses' intention to leave their current job. Psychiatry Services 52 (2), 232–234.

Jackson, D., Clare, J., Mannix, J., 2002. Who would want to be a nurse? Violence in the workplace—a factor in recruitment and retention. Journal of Nursing Management 10 (1), 13–20.

Kristensen, T.S., 2000. A New Tool for Assessing Psychosocial Factors at Work: The Copenhagen Psychosocial Questionnaire. National Institute of Health, Copenhagen.

Kümmerling, A., Hasselhorn, H.M., Tackenberg, P., the NEXT group, 2003. Psychometric properties of the scales used in the NEXT Study. In: Hasselhorn, H.M., Tackenberg, P., Mueller, B. H. (Eds.), Working Conditions and Intent to Leave the Profession among Nursing Staff in Europe. Working Life Research Report 7, National Institute for Working Life, Stockholm, pp. 237–258.

Lawoko, S., Soares, J.J., Nolan, P., 2004. Violence towards psychiatric staff: a comparison of gender, job and environmental characteristics in England and Sweden. Work and Stress 18 (1), 39–55.

Lewis, M.A., 2006. Nurse bullying, organizational considerations in the maintenance and perpetration of health care bullying cultures. Journal of Nursing Management 14 (1), 52–58.

Madison, J., Minichiello, V., 2001. Sexual harassment in healthcare, classification of harassers and rationalizations of sex-based harassment behavior. Journal of Nursing Administration 31 (11), 534–543.

McVicar, A., 2003. Workplace stress in nursing: a literature review. Journal of Advanced Nursing 44, 633–642.

Nelson, H.W., Cox, D.M., 2004. The causes and consequences of conflict and violence in nursing homes: working toward a collaborative work culture. Health Care Management (Frederick) 23 (1), 85–96.

Neumann, J.H., Baron, R.A., 1998. Workplace violence and workplace aggression. Evidence concerning specific forms,

potential causes and preferred targets. Journal of Management 24, 391–419.
Nolan, P., Soares, J., Dallender, J., Thomsen, S., Arnetz, B., 2001. A comparative study of the experiences of violence of English and Swedish mental health nurses. International Journal of Nursing Studies 38 (4), 419–426.
Omerov, M., Edman, G., Wistedt, B., 2004. Violence and threats of violence within psychiatric care: a comparison of staff and patient experience of the same incident. Nordic Journal of Psychiatry 58 (5), 363–369.
OSHA, 1998. Guidelines for Preventing Workplace Violence for Health Care and Social Service Workers. United States Department of Labor, Occupational Safety and Health Administration, OSHA 3148, Washington, DC.
Privitera, M., Weisman, R., Cerulli, C., Tu, X., Groman, A., 2005. Violence toward mental health staff and safety in the work environment. Occupational Medicine 55 (6), 480–486.
Randle, J., 2003. Bullying in the nursing profession. Journal of Advanced Nursing 43 (4), 395–401.
Rippon, T.J., 2000. Aggression and violence in health care professions. Journal of Advanced Nursing 31 (2), 452–460.
Roll, F.G., 1996. Analysis of Workplace Violence Guidelines, Healthcare Facilities Management Series, pp. 1–36.
Rothman, K.J., Greenland, S., 1998. Modem Epidemiology, second ed. Lippincot-Raven, Philadelphia.
Saarela, K.L., Isotalus, N., 1999. Workplace violence in Finland: high risk groups and preventive strategies. American Journal of Industrial Medicine Supplement 1, 80–81.
Sarnese, P.M., 1995. CQI strategies to reduce patient details. Journal of Healthcare Protection Management 11 (2), 8–20.
Sofield, L., Salmond, S.W., 2003. Workplace violence. A focus on verbal abuse and intent to leave the organization. Orthopedic Nursing 22 (4), 274–283.
Twisk, J.W.R., 2003. Applied Longitudinal Data Analysis for Epidemiology–A Practical Guide. Cambridge University Press, Cambridge.
Ware, J.E., Sherbourne, C.D., 1992. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Medical Care 30 (6), 473–483.
Whittington, R., Shuttleworth, S., Hill, L., 1996. Violence to staff in a general hospital setting. Journal of Advanced Nursing 24 (2), 326–333.
WHO, 1995. Violence: A Public Health Priority. World Health Organization, Geneva.
Zapf, D., Leymann, H., 1996. Mobbing and victimization at work. European Journal of Work and Organizational Psychology 5 (2) (special issue).