

## **Organizational justice and collaboration between nurses as correlates of violent assaults by patients in psychiatric care**

Virve PEKURINEN, RN, MNsc,

Department of Nursing Science, University of Turku, Turku, Finland

Maritta Anneli VÄLIMÄKI, Professor and Nursing Director, RN, PhD

Department of Nursing Science, University of Turku and Hospital District of Southwest  
Finland, Turku, Finland; School of Nursing, Hong Kong Polytechnic University, Hong Kong,  
China (SAR)

Marianna VIRTANEN, PhD, Professor, Finnish Institute of Occupational Health, Helsinki,  
Finland

Paula SALO, PhD, Professor, Department of Psychology, University of Turku, Finland;  
Finnish Institute of Occupational Health, Turku, Finland

Mika KIVIMÄKI, PhD, Department of Epidemiology and Public Health, University College  
London, London, UK; Clinicum, Faculty of Medicine, University of Helsinki, Helsinki,  
Finland

Jussi VAHTERA, MD, PhD, Professor, Department of Public Health, University of Turku  
and Turku University Hospital, Turku, Finland

Correspondence to: Virve Pekurinen, Department of Nursing Science, 20014 University of  
Turku, Finland; vimapek@utu.fi, +358407177225.

## **ABSTRACT**

**Objectives.** This study tested the hypothesis that poor organizational justice and collaboration are associated with nurses' increased stress and the increased likelihood of violent assaults by patients.

**Methods:** Cross-sectional survey was conducted in 90 psychiatric inpatient wards in five hospital districts and one regional hospital in Finland. 758 nurses (registered nurses or enrolled/mental health nurses) responded to the survey measuring psychosocial work environment and patient assaults. Self-administered postal questionnaires were used to assess organizational justice, collaboration, nurses' stress and patient violent assaults. Structural Equation Path Modeling (SEM) was used in model testing.

**Results:** SEM did not support a mediating role of stress between organizational justice, collaboration between nurses, and patient violent assaults, due to non-significant dependencies between stress and both organizational justice and patients' assaults. However, low organizational justice and poor collaboration between nurses were associated with increased patient violent assaults in psychiatric inpatient settings (all  $p < 0.05$ ). The model explained 5.7 % of violent assaults at nearly significant levels ( $p = 0.052$ ).

**Conclusions:** These findings suggest that organizational justice, collaboration between staff members and patient violent assaults are linked in psychiatric inpatient settings. Evaluating a variety of factors, including issues related to organizational justice and collaboration among nurses, may be useful to minimize assaults by patients in psychiatric settings.

## **INTRODUCTION**

Factors predicting patients' violent assaults on staff in psychiatric inpatient settings are poorly understood. Some studies suggest that the risk of assaults is increased in certain diagnoses, such as schizophrenia (1, 2), affective disorder (3) or impulse control disorder (4). Other patient characteristics, such as being male (2), having a history of violence (3, 5) or substance abuse (2, 3), having sleeping problems (6) or having poor self-reflective skills (5) have also been associated with assaults.

However, patient characteristics may explain only a proportion of violent assaults (7). There are other factors that may increase the risk of being subjected to violent assaults, such as shift work (8, 9) and fixed night work (10), poor information flow among co-workers (8), patient overcrowding (11) and nurses' uncertainty regarding treatment (9). Nurses' characteristics, such as being male (8, 9), being young (8, 9, 13), having a lower level of qualifications (9, 13), or having less training (13) or shorter work experience (13, 14), may also be associated with an increased risk for being subjected to assaults. One qualitative study reported that when nurses feel pressured at work, distractions or miscommunications between patients and staff may arise, which may result in patient assaults (15). This supports earlier findings where high job strain, psychological distress (16), job demands (17), time pressure at work (9), and problems in staff-patient interaction (18,12) have been factors associated with patient assaults. Further, workplace support (16), interpersonal relationships between staff (8), quality of teamwork (9) and organizational justice (16) may likewise play a role in patient assaults.

Justice refers to an action or decision that is morally right, based on ethics, religion, fairness, equity or law (19); organizational justice, originally derived from equity theory (20), refers to

an employee's perception of their organization's behaviors, decisions and actions and how these influence the employees own attitudes and behaviors at work (21). Previous research shows that when employees perceive low organizational justice, their stress levels (22, 23), intra-group conflicts (24) and workgroup misbehaviors increase (25). Poor teamwork creates inadequate program organization, which results in nurses' stress (26) and may further cause assaults on psychiatric wards (7, 27).

Despite such inconsistency in the literature, patient violence has attracted constant attention as a research topic (e.g. 8, 28). It has been suggested as one of the main reasons not only for decreased organizational commitment (8, 9) and intention to leave the profession (9, 29), but also for accidents, disability, death, absenteeism (29), negative feelings (30), lower job satisfaction (29) or burnout (9) among staff members. As patient violence towards nurses in psychiatric settings is a complex and multidimensional problem (7), there is an urgent need to identify the factors contributing to its prevalence.

In this cross-sectional survey study, we extended the ideas from existing research and hypothesized and tested a model where the following assumptions were formulated: first, organizational justice perceived by nurses is associated with their increased stress, which in turn is associated with increased number of patient violent assaults; second, low organizational justice is associated with poor collaboration among nurses; third, poor collaboration among nurses is associated with their increased stress, which in turn is associated with increased numbers of violent assaults by patients.

## **METHODS**

### **Participants and procedure**

Participants were selected from the Finnish Public Sector (FPS) study cohort, which includes employees working in ten towns and six hospital districts. Employers' records were used to identify eligible employees for nested survey cohorts to whom questionnaires have been mailed/e-mailed every four years since 2000. For our study, we used a subset of FPS cross-sectional questionnaire data collected in 2012 from five hospital districts (out of twenty) and one regional hospital providing specialized psychiatric care. Eligible participants were nurses (registered nurses, enrolled/ mental health nurses) working on the 90 psychiatric inpatient wards operational at the time of the survey (N = 1033). Of these, 758 (73%) responded to the survey in Finnish measuring psychosocial work environment and patient assaults. The Ethics Committee of the Helsinki and Uusimaa Hospital District approved the study. The principles of the Declaration of Helsinki were followed.

### **Measures**

All instruments, which are originally in English (organizational justice, TCI and GHQ-12), have been translated to Finnish before this study.

The occurrence of patient violent assaults was surveyed retrospectively with a measure developed for the purposes of the FPS study (11), by asking whether the respondents had encountered any of the four listed types of violent incidences at work (verbal threats, physical violence such as hitting or kicking, assaults on ward property such as throwing objects, or armed threats during the past year (1 = yes, 0 = no). Respondents also indicated in which month the exposure occurred (1 = January... 12 = December). The occurrence of patient

violent assaults was combined into a sum score by calculating the number of months that any of the four exposures had occurred during the past 12 months (range 0-48). In this study, the internal consistency of the scale was respectable measured by the Kuder-Richardson Formula (.77).

Organizational justice was measured using a questionnaire of procedural and relational justice adopted from Moorman's organizational justice measure (31, 32). Procedural justice refers to the extent that decision-making procedures include input from all parties affected, are consistently applied, are accurate, suppress bias, are correctable and ethical. Relational justice refers to considerate, polite, and fair treatment of individuals. (33) The questionnaire measured procedural justice (7 items) and relational justice (6 items) on a five-point scale (1 = totally disagree... 5 = totally agree) according to respondents' current opinions. The mean scale scores were used: the higher the score the better the organizational justice. The instrument has been used with Finnish healthcare staff (e.g. 34) and its internal consistency has been strong (procedural justice  $\alpha = .90$  [32];  $\alpha = .80$  [35]; relational justice  $\alpha = .81$  [32];  $\alpha = .90$  [35]). In our data the internal consistency of the scales remained strong (procedural justice  $\alpha = .94$ , relational justice  $\alpha = .91$ ).

Collaboration was measured using two subscales (Participative safety, 4 items; Support for innovation, 3 items; 1 = totally disagree... 5 = totally agree) derived from the 14-item Team Climate Inventory (TCI) (36, 37). Participative safety refers to when "involvement in decision-making is motivated and reinforced while occurring in an environment which is perceived as interpersonally nonthreatening", while support for innovation refers to the "expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment" (38). The mean subscale scores were used: the

higher the score, the better the collaboration. The subscales have been used with Finnish healthcare staff (e.g. 39). Their internal consistency has been strong in earlier studies (participative safety  $\alpha = .87$ , support for innovation  $\alpha = .81$  [40]) and remained strong in our data (participative safety  $\alpha = .86$ , support for innovation  $\alpha = .82$ ).

Nurses' psychological distress (stress) was measured with the 12-item General Health Questionnaire (GHQ-12), which measures minor psychiatric morbidity (41). Respondents rate the extent to which they have experienced the symptoms of distress in the past few weeks (0 = not at all, 1 = same as usual, 2 = rather more than usual, 3 = much more than usual). The mean scale score was used; the higher the score, the greater the stress. The scale has previously been used as an indicator of stress (42, 43, 44, 45). GHQ-12 has been used with Finnish healthcare staff (e.g. 46) and has been validated in the Finnish population (47). The internal consistency of the scale has been strong ( $\alpha = .90$  [48];  $\alpha = .85$  [49]), and it remained strong in our data ( $\alpha = .88$ ).

### **Data analysis**

Our proposed model consisted of organizational justice, collaboration among nurses, stress and patient violent assaults. Stress was considered as a mediator between the two factors (organizational justice, collaboration) and patient violent assaults. The model was encoded into a multiple regression equation by arrows indicating the relationships between specific factors. The model construction is described in Figure 1 (model 1). The fit of the model was determined by testing the hypothesized model using structural equation modeling (SEM) and with maximum likelihood estimations. SEM was chosen because it is suitable for confirmatory testing of hypothesized models supported by either theories and/or empirical research. Criteria for goodness-of-fit of the model included non-significant chi-square

statistics ( $\chi^2$ , p, degree of freedom), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). The chi-square test is an absolute test of model fit: the model is rejected in case of  $p < .05$ . CFI takes into account the model fitting: it may range between 0 and 1 with values close to 1 indicating very good fit (50); in this study the CFI was set at  $>.95$ . Further, a TLI index close to 1.0, and RMSEA values  $< .05$  were set as criteria for a fit model (51). SRMR, the most sensitive index to detect misspecified latent structures or factor covariances, was set at  $\leq .08$ . (51) The model's ability to explain assaults was assessed using the coefficient of determination ( $R^2$ ) (52). Mplus was used for the SEM and for other analyses, the SPSS V21 (SPSS IBM, New York, USA).

## **RESULTS**

### **Descriptive characteristics**

The majority of the participants ( $N = 758$ ) were female (74%), registered nurses (58%), working full-time (95%) on a permanent employment contract (78%). The majority had been exposed to verbal threats (59%,  $n = 424$ ) during the past year, 46% reported assaults on ward property ( $n = 338$ ), 35% exposure to physical violence ( $n = 251$ ) and 5% reported armed threats ( $n = 34$ ).

Demographic information about the participants is presented in **Table 1**.

**Table 2** presents the means, SDs, internal consistency values, and correlations for each observed variable.



## **Constructed Structural Equation Models**

The original model (model 1, Figure 1), where stress was considered as a mediator between organizational justice, collaboration, and patients' assaults, was rejected due to poor model fit indicated by significant chi-square and RMSEA values (with 90% CI = .03 – .08). Stress as a mediating factor was also rejected due to non-significant dependencies between stress and both organizational justice and patients' assaults. Model 1 did not explain assaults at significant levels.

Based on the parameter estimates, we modified the model by removing the mediating factor stress to achieve better goodness-of-fit (model 2, Figure 1). Akaike's Information Criterion (AIC) and Bayes Information Criterion (BIC) were used to compare the alternative models (53). The overall lowest values of AIC and BIC represent the best model fit (54). The results from the analysis of model 2 indicated a more acceptable model fit on all indices (RMSEA with 90% CI = .00 – .05). Lower AIC and BIC indices in model 2 (compared to model 1) also indicated a better fit for model 2. Further, in model 2, dependencies between factors were all statistically significant at the .05 level: organizational justice was positively related to collaboration among nurses, suggesting that low organizational justice is associated with poor collaboration among nurses. Organizational justice was negatively related to assaults, suggesting that lower organizational justice is associated with more frequent assaults. Collaboration was positively related to assaults, which may indicate that better collaboration between nurses is associated with more frequent assaults. However, the correlations between observed collaboration variables and assaults were negative (Table 2), indicating a negative relationship between the two factors. The dependency between collaboration and assaults might be affected by the strong dependencies between other model factors (organizational justice and collaboration  $p \leq .001$ , organizational justice and assaults  $p = .001$ ) thus creating a

false positive dependency. Therefore, we may assume that the relationship is negative; indicating that poor collaboration between nurses is associated with more frequent patient assaults. Model 2 explained 5.7% of patient assaults at nearly significant levels ( $p=.052$ ).

**Table 3** shows the goodness-of-fit indices and the coefficient of determination ( $R^2$ ) of the alternative models.

## **DISCUSSION**

To examine patient violent assaults on psychiatric wards, we hypothesized and tested a model where nurses' stress was considered as a mediator between other model factors (organizational justice and collaboration between nurses) and patient violent assaults.

However, stress was not related either to patient violent assaults or organizational justice, and therefore the mediating role of stress was not supported.

Although we are not aware of exactly similar studies to compare ours with, we may still assume that our results are, surprisingly, not in line with those of earlier studies. For example, in a cross-sectional study conducted among Italian public healthcare sector workers, indications were found that psychological disorders among staff, measured by the same questionnaire as in our study, might precede certain types of violence towards staff (16). However, the study population consisted of all professions working in any specialty in the public healthcare sector, which differs greatly from our study population, comprising only nurses working on acute psychiatric wards.

The psychiatric nursing population itself may be the explanation for these contradictory study results because of the nature of their work. For example, one study reported that nurses'

mental health status measured by GHQ-12 was not associated with patient violence in psychiatric settings, whereas such an association was observed in other settings (29). There may be several reasons for this. It can be assumed, for example, that psychiatric nurses are more used to dealing with aggressive patients than are nurses in other medical fields. Also, psychiatric nurses' behavior may not be as strongly affected by stress as is the behavior of nurses working in other specialties.

It is also possible that the instrument used in this study did not capture the dimensions of stress, which have been previously documented to be associated with violence; for example, the Italian cross-sectional study (16) found certain aspects of stress, such as job demands and poor workplace social support, as defined in Karasek's model (55), to be risk factors for violence (16). Therefore, it may not be psychological distress, as measured in our study, that are associated with patient violence, but increased job demands (16) and pressures (15), and lack of support in the workplace (16).

Our results regarding the association of poor collaboration among nurses with patient violence are not only in line with those of the Italian cross-sectional study concerning workplace support (16), but also with other findings (8, 9). Quality of teamwork (9) and workplace interpersonal relationships (8) are also associated with violence. Good collaboration among nurses may have a positive effect on the ability of teams to respond to violence and the overall calmness of the atmosphere on wards, which may reduce patient aggression.

Our findings regarding an association between nurses' perceptions of organizational justice and patient assaults are in accordance with those of an earlier study (16). However, the

mechanisms remain unknown. Research has shown that low justice perceptions negatively affect workers' behavior in groups (25) and increase intra-group conflicts among nurses (24). Therefore, we could draw the tentative conclusion that low justice perceptions may not only negatively affect nurses' behavior towards colleagues, but also nurses' behavior towards patients by means of poor staff-patient interaction, which may be associated with increased patient assaults (12).

This study has limitations. First, the cross-sectional design prevents us from making causal statements about the results. The fact that patient assaults were evaluated retrospectively, while other model variables were based on nurses' current experiences, may have resulted in directions of causality being opposite to those proposed in the hypothesized model (for example, increased assaults may predict poor collaboration and low organizational justice rather than vice versa). Therefore, longitudinal research is needed to evaluate the impact of organizational justice and collaboration on patient assaults.

Second, relying on nurses' retrospective recall of assaults may have caused some misclassifications. Staff may e.g. overestimate the frequency of assaults, although underreporting is possible when other assessment methods, such as daily staff reports, standard instruments and official incident reports [56] [57] [58]) are used, irrespective of the severity of assaults (56). Staff may consider assaults part of their job (59) or feel embarrassed (60), which may increase underreporting. It has been suggested, that self-reporting methods relying on memory, like other types of assessment methods, are likely to underestimate the occurrence of assaults (61). However, supporting the validity of our measurement assessing the occurrence of assaults, earlier studies have found an increasing risk of self-reported physical assaults connected to patient overcrowding, a risk of violence in psychiatric settings

(11), and an exceptionally high risk of exposure to mental abuse and physical violence for special education teachers when compared to their colleagues in general education (62). In addition, the occurrence of aggression we found is quite similar to those of earlier studies (28, 63).

Third, the model explained only a small amount of the variance, which might question the significance of the findings. However, we had no information on the most important predictors of aggression, such as patient characteristics or severity of the disease. Thus, a small amount of variance explained by the models was to be expected. It should be noted that the associations between factors were statistically significant, and the purpose of our study was not to make precise predictions, but to understand the phenomena.

## **CONCLUSION**

In conclusion, nurses' perceptions of poor organizational justice and poor collaboration among nurses were found to be linked to increased patient assaults, while nurses' stress, as measured by psychological distress, was not. Longitudinal research is needed to verify our findings and determine the direction of causality. Also, clarifying the mechanisms underlying the associations between nurses' work-related stress and patient assaults in psychiatric nursing needs attention in future research, especially the aspects of stress that may increase the risk for assaults. In addition, the mechanisms underlying the association between nurses' perceptions of organizational justice and patient aggression need to be clarified.

Our findings suggest that evaluating a variety of factors, including organizational justice and collaboration related issues, is important in minimizing patient assaults in psychiatric settings, both on the front line and at the administrative level.

## **DISCLOSURES AND ACKNOWLEDGEMENTS**

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## REFERENCES

1. Amoo G, Fatoye FO: Aggressive behaviour and mental illness: a study of in-patients at Aro Neuropsychiatric Hospital, Abeokuta. *Nigerian journal of clinical practice* 13:351-355, 2010
2. Dack C, Ross J, Papadopoulos C, et al: A review and meta-analysis of the patient factors associated with psychiatric in-patient aggression. *Acta Psychiatrica Scandinavica* 127:255-268, 2013
3. Stewart D, Bowers L: Inpatient verbal aggression: content, targets and patient characteristics. *Journal of psychiatric and mental health nursing* 20:236-243, 2013
4. Sadock BJ, Sadock VA, Ruiz P, et al: *Kaplan & Sadock's Comprehensive Textbook of Psychiatry*. Philadelphia, Wolters Kluwer/Lippincott Williams & Wilkins, 2009
5. Ekinici O, Ekinici A: Association between insight, cognitive insight, positive symptoms and violence in patients with schizophrenia. *Nordic Journal of Psychiatry* 67:116-123, 2013
6. Kamphuis J, Dijk DJ, Spreen M, et al: The relation between poor sleep, impulsivity and aggression in forensic psychiatric patients. *Physiology & Behavior* 123:168-173, 2014
7. Cutcliffe JR, Riahi S: Systemic perspective of violence and aggression in mental health care: towards a more comprehensive understanding and conceptualization: part 2. *International Journal of Mental Health Nursing* 22:568-578, 2013
8. Camerino D, Estryng-Behar M, Conway PM, et al: Work-related factors and violence among nursing staff in the European NEXT study: a longitudinal cohort study. *International Journal of Nursing Studies* 45:35-50, 2008

9. Estryng-Behar M, van der Heijden B, Camerino D, et al: Violence risks in nursing-- results from the European 'NEXT' Study. *Occupational Medicine* 58:107-114, 2008
10. Nabe-Nielsen K, Tuchsén F, Christensen KB, et al: Differences between day and non-day workers in exposure to physical and psychosocial work factors in the Danish eldercare sector. *Scandinavian Journal of Work, Environment & Health* 35:48-55, 2009
11. Virtanen M, Vahtera J, Batty GD, et al: Overcrowding in psychiatric wards and physical assaults on staff: data-linked longitudinal study. *The British Journal of Psychiatry : the Journal of Mental Science* 198:149-155, 2011
12. Papadopoulos C, Ross J, Stewart D, et al: The antecedents of violence and aggression within psychiatric in-patient settings. *Acta Psychiatrica Scandinavica* 125:425-439, 2012
13. Flannery RB,Jr, LeVitre V, Rego S, et al: Characteristics of staff victims of psychiatric patient assaults: 20-year analysis of the Assaulted Staff Action Program. *The Psychiatric Quarterly* 82:11-21, 2011
14. Privitera M, Weisman R, Cerulli C, et al: Violence toward mental health staff and safety in the work environment. *Occupational Medicine* 55:480-486, 2005
15. Ward L: Ready, aim fire! Mental health nurses under siege in acute inpatient facilities. *Issues in Mental Health Nursing* 34:281-287, 2013
16. Magnavita N, Heponiemi T: Violence towards health care workers in a Public Health Care Facility in Italy: a repeated cross-sectional study. *BMC Health Services Research* 12:108-6963-12-108, 2012
17. Demir D, Rodwell J: Psychosocial antecedents and consequences of workplace aggression for hospital nurses. *Journal of Nursing Scholarship* 44:376-384, 2012



18. Wenzhi C, Ling D, Meng L, et al: Antecedents of medical workplace violence in South China. *Journal of Interpersonal Violence* 26:312-327, 2011
19. Tabibnia G, Satpute AB, Lieberman M D: The sunny side of fairness: Preference fairness activates reward circuitry (and disregarding unfairness activates self-control circuitry). *Psychological Science* 19: 339-347, 2008
20. Adams JS: Inequity in social exchange; in *Advances in experimental social psychology*, volume 2. Edited by Berkowitz L. New York, Academic Press, 1965
21. Greenberg J: A taxonomy of organizational justice theories. *Academy of Management Review*, 12: 9-22, 1987
22. Sutinen R, Kivimaki M, Elovainio M, et al: Organizational fairness and psychological distress in hospital physicians. *Scandinavian Journal of Public Health* 30:209-215, 2002
23. Dackert I: The impact of team climate for innovation on well-being and stress in elderly care. *Journal of Nursing Management* 18:302-310, 2010
24. Almost J, Doran DM, McGillis Hall L, et al: Antecedents and consequences of intra-group conflict among nurses. *Journal of Nursing Management* 18:981-992, 2010
25. Priesemuth M, Arnaud A, Schminke M: Bad Behavior in Groups: The Impact of Overall Justice Climate and Functional Dependence on Counterproductive Work Behavior in Work Units. *Group & Organization Management* 38:230-257, 2013
26. Bowers L, Nijman H, Simpson A, et al: The relationship between leadership, teamworking, structure, burnout and attitude to patients on acute psychiatric wards. *Social Psychiatry and Psychiatric Epidemiology* 46:143-148, 2011

27. Whittington R, Wykes T: An observational study of associations between nurse behaviour and violence in psychiatric hospitals. *Journal of Psychiatric and Mental Health Nursing* 1:85-92, 1994
28. Spector PE, Zhou ZE, Che XX: Nurse exposure to physical and nonphysical violence, bullying, and sexual harassment: a quantitative review. *International Journal of Nursing Studies* 51:72-84, 2014
29. Merez D, Rymaszewska J, Moscicka A, et al: Violence at the workplace--a questionnaire survey of nurses. *European Psychiatry* 21:442-450, 2006
30. Needham I, Abderhalden C, Halfens RJ, et al: Non-somatic effects of patient aggression on nurses: a systematic review. *Journal of Advanced Nursing* 49:283-296, 2005
31. Moorman R: Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship? *The Journal of Applied Psychology* 76:845-855, 1991
32. Elovainio M, Kivimaki M, Vahtera J: Organizational justice: evidence of a new psychosocial predictor of health. *American Journal of Public Health* 92:105-108, 2002
33. Kramer RM, Tyler TR: *Trust in Organizations: Frontiers of Theory and Research*. London, Sage, 1996
34. Heponiemi T, Kuusio H, Sinervo T, et al: Job attitudes and well-being among public vs. private physicians: organizational justice and job control as mediators. *European Journal of Public Health* 21:520-525, 2011

35. Elovainio M, Kivimaki M, Vahtera J, et al: Sleeping problems and health behaviors as mediators between organizational justice and health. *Health Psychology* 22:287-293, 2003
36. Anderson N, West M: Measuring climate for work group innovation: development and validation of the team climate inventory. *Journal of Occupational Behavior* 19:235-258, 1998
37. Kivimaki M, Elovainio M: A short version of the Team Climate Inventory: Development and psychometric properties. *Journal of Occupational and Organizational Psychology* 72:241-246, 1999
38. West MA: The social psychology of innovation in groups; in *Innovation and creativity at work: Psychological and organizational strategies*. Edited by West MA, Farr JL. Chichester, Wiley, 1990
39. Virtanen M, Kurvinen T, Terho K, et al: Work hours, work stress, and collaboration among ward staff in relation to risk of hospital-associated infection among patients. *Medical Care* 47:310-318, 2009
40. Heponiemi T, Elovainio M, Kouvonen A, et al: Ownership type and team climate in elderly care facilities: the moderating effect of stress factors. *Journal of Advanced Nursing* 68:647-657, 2012
41. Goldberg D: *Detecting Psychiatric Illness by Questionnaire*. London, UK, Oxford University Press, 1972
42. Kunkler J, Whittick J: Stress-management groups for nurses: practical problems and possible solutions. *Journal of Advanced Nursing* 16:172-176, 1991

43. Paterson B, Turnbull J, Aitken I: An evaluation of a training course in the short-term management of violence. *Nurse Education Today* 12:368-375, 1992
44. Carson J, Cavagin J, Bunclark J, et al: Effective communication in mental health nurses: Did social support save the psychiatric nurse? *NT research* 4:31-42, 1999
45. van Weert JC, van Dulmen AM, Spreeuwenberg PM, et al: The effects of the implementation of snoezelen on the quality of working life in psychogeriatric care. *International Psychogeriatrics* 17:407-427, 2005
46. Elovainio M, Salo P, Jokela M, et al: Psychosocial factors and well-being among Finnish GPs and specialists: a 10-year follow-up. *Occupational and Environmental Medicine* 70:246-251, 2013
47. Holi MM, Marttunen M, Aalberg V: Comparison of the GHQ-36, the GHQ-12 and the SCL-90 as psychiatric screening instruments in the Finnish population. *Nordic Journal of Psychiatry* 57:233-238, 2003
48. Virtanen M, Kivimaki M, Elovainio M, et al: From insecure to secure employment: changes in work, health, health related behaviours, and sickness absence. *Occupational and Environmental Medicine* 60:948-953, 2003
49. Ip WY, Martin CR: Psychometric properties of the 12-item General Health Questionnaire (GHQ-12) in Chinese women during pregnancy and in the postnatal period. *Psychology, Health & Medicine* 11:60-69, 2006
50. Bentler PM: Comparative fit indexes in structural models. *Psychological Bulletin* 107:238-246, 1990

51. Hu L, Bentler P: Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternative. *Structural Equation Modeling* 6:1-55, 1999
52. Lewis-Beck M: R-Squared, in *The SAGE Encyclopedia of Social Science Research Methods*. Edited by Lewis-Beck M, Bryman A and Liao T. Thousand Oaks, CA, USA, Sage Publications, Inc, 2004
53. Kaplan D: *Structural Equation Modeling: Foundations and Extensions*. Los Angeles, Calif. London, Sage, 2009
54. Byrne BM: *Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming*. New York, Routledge, 2012
55. Karasek R, Choi B, Ostergren PO, et al: Testing two methods to create comparable scale scores between the Job Content Questionnaire (JCQ) and JCQ-like questionnaires in the European JACE Study. *International Journal of Behavioral Medicine* 14:189-201, 2007
56. Hvidhjelm J, Sestoft D, Bjørner JB: The Aggression Observation Short Form identified episodes not reported on the Staff Observation Aggression Scale--Revised. *Issues in Mental Health Nursing* 35: 464-469, 2014
57. Tenneij NH, Goedhard LE, Stolker JJ et al: The correspondence between the Staff Observation Aggression Scale-Revised and two other indicators for aggressive incidents. *Archives of Psychiatric Nursing* 23: 283-288, 2009
58. Snyder LA, Chen, PY, Vacha-Haase T: The underreporting gap in aggressive incidents from geriatric patients against certified nursing assistants. *Violence and Victims* 22: 367-379, 2007

59. Stevenson KN, Jack SM, O'Mara L et al: Registered nurses' experiences of patient violence on acute care psychiatric inpatient units: an interpretive descriptive study. *BMC Nursing* 14: 1-13, 2015, DOI: 10.1186/s12912-015-0079-5
60. Benson A, Secker J, Balfe E et al: Discourses of blame: accounting for aggression and violence on an acute mental health inpatient unit. *Social Science & Medicine* 57:917-926, 2005
61. Iennaco J, Dixon J, Whittemore R et al: Measurement and Monitoring of Health Care Worker Aggression Exposure. *The Online Journal of Issues in Nursing* 18, 2013, DOI: 10.3912/OJIN.Vol18No01Man03
62. Ervasti J, Kivimäki M, Pentti J et al. Work-related violence, lifestyle and health among special education teachers working in Finnish basic education. *Journal of School Health* 82: 336-343, 2012
63. Chen WC, Hwu HG, Kung SM et al. Prevalence and determinants of workplace violence of health care workers in a psychiatric hospital in Taiwan. *Journal of Occupational Health* 50: 288-93, 2008

**Figure 1.** Model 1 and model 2, parameter estimates

OJ=Organizational justice, RJ=Relational justice, PJ=Procedural justice,

COLL=Collaboration, PS=Participatory safety, SI=Support for innovation, STR=Stress,

PVA=Patient violent assaults. Latent variables are depicted in ovals while observed variables are depicted in rectangles.

**Table 1.** Demographic information on participants

Characteristic	N	%
<b>Age (M±SD)</b>	43.96± 10.95	.
<b>Gender</b>		
Female	558	74%
Male	200	26%
<b>Marital status</b>		
Married or cohabitated	568	75%
Divorced or separated	89	12%
Single	92	12%
Widowed	7	1%
<b>Professional status</b>		
Registered nurse	436	58%
Enrolled nurse	241	32%
Head nurse	81	10%
<b>Employment</b>		
Permanent	592	78%
Fixed-term	166	22%
<b>Nature of work</b>		
Full-time job	722	95%
Part-time job	36	5%
<b>Type of working time</b>		
Day work	235	30%
Shift work without nights	118	16%
Shift work with night	367	49%
Night work	28	4%
Other irregular work	9	1%
<b>Duration of employment (M±SD)</b>		
Years in current organization	9.14±8.78	.
Years in current position	8.01±8.67	.



**Table 2.** Means, standard deviations, internal consistency values and correlations of observed variables [PS=Participatory safety, SI=Support for innovation, RJ=Relational justice, PJ=Procedural justice, STR=Stress, PVA=Patient violent assaults]

Variable	Mean	SD	$\alpha$	PS	SI	RJ	PJ	STR	PVA
PS	3.7	.80	.86	1.000	·	·	·	·	·
SI	3.3	.82	.82	.606	·	·	·	·	·
RJ	3.7	.98	.91	.477	.441	1.000	·	·	·
PJ	2.9	.81	.94	.352	.358	.416	1.000	·	·
STR	1.9	.39	.88	-.186	-.197	-.100	-.141	1.000	·
PVA	4.6	8.37	.77 <sup>a</sup>	-.056	-.024	-.134	-.108	-.018	1.000

<sup>a</sup> Internal consistency measured by Kuder-Richardson Formula

**Table 3.** Goodness-of-fit indices for the hypothesized model (model 1) and the alternative model (model 2)

Model	$\chi^2$	$p$	$df$	CFI	TLI	AIC	BIC	SRMR	RMSEA	R <sup>2</sup> /PVA <sup>a</sup>	$p$
1	23.66	.001	7	.979	.955	12940.814	13033.427	.037	.056	.000	.800
2	1.82	.611	3	1.000	1.005	12217.929	12296.651	.007	.000	.057	.052

<sup>a</sup> Patient violent assaults