



Psychosocial work characteristics associated with distress and intention to leave nursing education among students; A one-year follow-up study

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ABSTRACT

Background: Dropout in later years of the nursing degree programme involves lost investment and is a particular problem for both students and educators. Reasons for late dropout seem to be related to the work and learning environment of the clinical placement.

Objectives: The aim of this study was to investigate associations between psychosocial work characteristics and distress and intention to leave nursing education among third-year nursing students.

Design: A prospective cohort study.

Setting: A Bachelor of Nursing programme of a University of Applied Sciences in the Netherlands.

Participants: 363 third-year nursing students.

Methods: Baseline and one-year follow-up measurements were used from a prospective cohort study. Third-year nursing students were invited annually in May between 2016 and 2018. Psychosocial work characteristics were psychological demands, supervisor and co-worker support, and acts of offensive behaviour. Logistic regression analyses were used to build multivariate models.

Results: Frequent exposure to violence (OR = 2.52, 95% CI: 1.29–4.92) was univariately associated with distress. In the multivariate model for distress, psychological demands (OR = 1.63, 95% CI: 1.05–2.52) and frequent exposure to violence (OR = 3.02, 95% CI: 1.48–6.19) were associated with distress. Supervisor support (OR = 0.54, 95% CI: 0.36–0.80) and co-worker support (OR = 0.41, 95% CI: 0.24–0.72) were negatively associated with intention to leave (i.e. were protective) in the univariate model. In the adjusted multivariate model, only co-worker support (OR = 0.50, 95% CI: 0.25–0.97) was a protective factor for an intention to leave.

Conclusion: Psychological demands and frequent exposure to violence are risk factors for distress, and co-worker support is a protective factor reducing the intention to leave nursing education in the last stage of the programme. Improving the psychosocial working climate of nursing students may reduce the intention to leave at a late stage in nursing education, and hence actual late dropout.

1. Introduction

Dropout among nursing students is a multifactorial phenomenon and has been examined in previous studies, mainly focusing on early dropout or dropout in general (e.g., Hamshire et al., 2019; Eick et al., 2012;

O'Donnell, 2011; Andrew et al., 2008; Glogowska et al., 2007). Dropout occurs in different stages of the nursing educational programme; dropout in later years of the nursing degree programme involves lost investment and is a particular problem for both students and educators. Reasons for late dropout seem to be related more to the clinical

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placement than to the academic programme (Bakker et al., 2019; Ten Hoeve et al., 2017). Clinical placements form a major part of the nursing educational programme (Eick et al., 2012). In the systematic review of Eick et al. (2012) on placement-related dropout, unpleasant experiences, lack of acceptance and lack of support in the workplace were found to be major factors for nursing student dropout. It may be possible to reduce late dropout among nursing students by making changes to the work and learning environment in their clinical placements.

2. Background

The association between nurses' work environment and dropout and dropout-related outcomes (e.g., intention to leave, sickness absence, distress and burnout) has been explored in several studies using influential psychosocial models, such as the Job Demands-Resources model (Demerouti et al., 2001) or the Job Demand-Control (-Support) model (Karasek et al., 1998). In these models, psychosocial work characteristics, such as psychological job demands, job control and co-worker and supervisor support, are aspects of the psychosocial work environment. These characteristics play a role in predicting developments in job-related illnesses, psychological distress, job engagement and early exit. For instance, in a study by Moloney et al. (2017) higher workload and higher work-life interference were the strongest predictors of intentions to leave the healthcare organisation and the nursing profession. Support from colleagues, and supervisor and organisational support were indirectly linked, via burnout and work engagement, to the intention to leave the organisation and the nursing profession. Acts of offensive behaviour can be seen as contributors to job demands and include verbal and physical violence, bullying, gossip and slander, sexual harassment, and discrimination (Pejtersen et al., 2010). Clausen et al. (2012, 2016) conducted two studies among staff in residential care settings and found that threats of violence, physical violence, bullying, and sexual harassment increased long-term sickness absence.

However, information regarding whether and to what extent psychosocial work characteristics contribute to dropout from nursing education is scarce. Although this was examined in some qualitative and cross-sectional quantitative studies, longitudinal quantitative research is limited (Eick et al., 2012). Only a few longitudinal studies have been performed on student nurse dropout: three retrospective studies (Prymachuk et al., 2009; Wray et al., 2012, 2017) and one prospective study (Deary et al., 2003). Deary et al. (2003) found associations between personality traits and dropout; those who discontinued their training scored lower on the traits of agreeableness and conscientiousness. No associations were found between sex, age, cognitive ability, coping strategies and psychological distress. Prymachuk et al. (2009) found associations between dropout and age, prior education, gender, migrant status, clinical placement and specialty branch, and Wray et al. (2012, 2017) discovered associations for demographic characteristics such as age, distance from the nursing programme and having previous care experiences.

In order to intervene early and to avoid nursing students dropping out at a late stage in their training, it is important to know which modifiable psychosocial work characteristics are associated with dropout from nursing education. Distress and intention to leave nursing education are linked to dropout (Deary et al., 2003). Therefore, the aim of our study was to investigate the association for students of psychosocial work characteristics with distress and intention to leave nursing education.

3. Methods

3.1. Design and participants

This prospective cohort study consisted of three consecutive cohorts of third-year nursing students who participated in the larger SPRiNG cohort study at the Rotterdam University of Applied Sciences in the

Netherlands. SPRiNG is an acronym for Studying Professional Resilience in Nursing students and new Graduates. This study aims to examine health-related protective and risk factors for dropout and retention of nursing students during their education and at the start of their career (Bakker et al., 2018). The university's Bachelor of Nursing programme has an average annual intake of approximately 500 first-years and offers an accredited four-year educational programme. During training, a minimum of four 20-week clinical placements take place; one in the second year, two in the third year and one in the fourth year of the programme. Students with part-time or study-work trajectories have clinical placements during the entire third and fourth years of training. During clinical placements, nursing students practice nursing roles in various healthcare settings, guided by a clinical supervisor (a registered nurse) and a faculty member from the nursing degree programme. This faculty member monitors the quality of the learning climate and study progress.

3.2. Procedure

In this prospective cohort study, psychosocial work and background characteristics were measured at baseline, and outcomes were measured at follow-up. A conceptual framework is presented in Fig. 1. To perform an analysis on participants with missing data at follow-up, the outcomes distress and intention to leave were also measured at baseline.

Third-year nursing students were invited annually in May between 2016 and 2018. Participation by the third-year nursing students was facilitated within the educational programme by offering a self-administered (baseline) questionnaire in the second part of semester two in the third year of the programme and another (follow-up) questionnaire a year later in their final (fourth) year. The questionnaires were offered as part of the curriculum during lessons that address their professional development (baseline) and their research skills (follow-up). They were informed about the study before being approached for participation. Students could choose whether to make their data available for the SPRiNG research project. Besides data from the questionnaires, data was used from the Rotterdam University of Applied Sciences' record systems to determine the study status of the participants. All students who completed the questionnaire at baseline and gave their informed consent were followed ($N = 711$).

3.3. Measurement instruments

To measure non-specific distress, the Distress Screener (Braam et al., 2009) was used. It comprises three items from the 4DSQ distress subscale. The 4DSQ is a self-report 50-item questionnaire that measures non-specific distress, depression, anxiety and somatisation. The Distress Screener is a valid instrument for early identification of distress in employees on sick leave as well as for employees not on sick leave but at risk of future absence due to mental illness (van Hoffen et al., 2016). The Distress Screener contains the following three items: (1) "Did you suffer from worrying in the last week?" (2) "Did you suffer from listlessness in the past week?" (3) "Did you feel tense in the last week?" The answer categories for the questions were: 'no' (score 0), 'sometimes' (score 1), or 'regularly/very often' (score 2). The scores of the three questions were added together; a total score of 4 or higher was used to detect moderate distress (Braam et al., 2009). The Cronbach's alpha (0.83) showed good internal consistency of the scale at baseline and follow-up.

Intention to leave nursing education, was measured by one self-formulated statement: "I am considering quitting my study." Answers were rated on a 10-point Likert scale ranging from 'definitely not' (score 1) to 'definitely yes' (score 10). A cut-off point of >1 was used to detect an intention to leave, given the distribution of the scores. Finally, actual dropout at follow-up was measured through data on student status, retrieved from the university's student administration. This data was classified in two categories: dropped out or not dropped out.

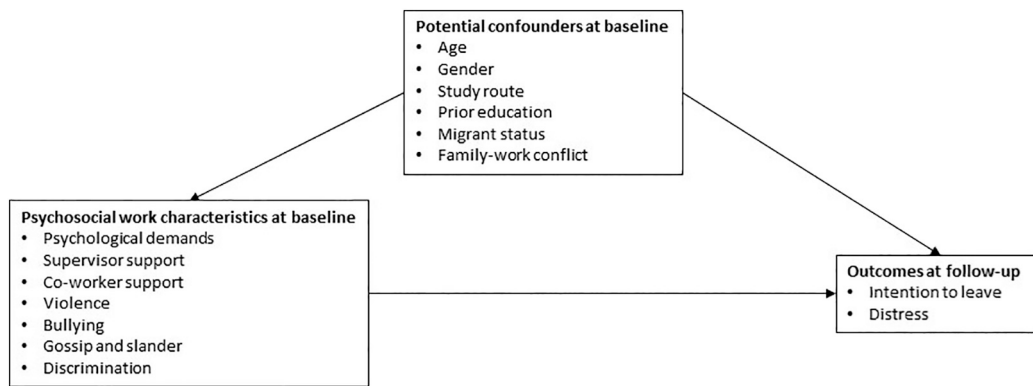


Fig. 1. Conceptual framework of the relationship between psychosocial work characteristics, potential confounders and outcomes.

3.4. Measurement instruments psychosocial work characteristics

Psychological demands, supervisor support and co-worker support were measured using three subscales of the validated Dutch version of the Job Content Questionnaire [JCQ] (Karasek et al., 1998). The JCQ measures the physical and psychological characteristics of an imbalance between job demands and resources within an organisation. Responses are on a 4-point Likert scale ranging from ‘totally disagree’ to ‘totally agree’. The psychological demands scale contains five items: “work fast”, “work hard”, “no excessive work”, “enough time”, and “conflicting demands”. In the supervisor support subscale, ‘supervisor’ was replaced by ‘clinical supervisor’ (referring to the teaching nurse). This subscale contains four items; the clinical supervisor: “is concerned”, “pays attention”, “is helpful” and “is a good organiser”. Co-worker support contains four items; co-workers: “are competent”, “take an interest in me”, “are friendly” and “are helpful”. The internal consistency of the scales is good with Cronbach’s Alphas ranging from 0.71 (psychological demands) to 0.87 (clinical supervisor).

Acts of offensive behaviour (threats of and physical violence; bullying; gossip and slander) were measured by single-item questions taken from the second medium and long version of the Copenhagen Psychosocial Questionnaire [COPSOQ II] (Pejtersen et al., 2010). The Dutch translation was obtained from the Healthy Working in Healthcare questionnaire (Bronkhorst et al., 2014). All three items contain one question with five answer categories: (1) ‘never’, (2) ‘a few times’, (3) ‘every month’, (4) ‘every week’ and (5) ‘every day’. Threats of and physical violence were measured by two items of the COPSOQ II, which follow the World Health Organisation’s definition of violence (World Health Organization [WHO], 2002), which includes actual and threatened use of physical force: “Have you been exposed to threats of violence or physical violence at your workplace during the last 12 months?”. To address the target group directly, ‘workplace’ was replaced by ‘clinical placement’ and ‘the last 12 months’ by ‘the current academic year’. Bullying was defined as repeated exposure to unpleasant or degrading treatment where the person involved finds it difficult to defend himself or herself against this. Gossip and slander was measured with one question: “Have you been exposed to gossip and slander at your clinical placement during the current academic year?”.

Discrimination was measured by one question from the Netherlands Working Conditions Survey 2014: “Have you been personally discriminated against during your clinical placement/work this academic year?” (Hooftman et al., 2015). The answering categories were: (1) ‘no’ and (2) ‘yes’.

3.5. Measurement instruments potential confounders

Based on other studies (Deary et al., 2003; Watson et al., 2009; Eick et al., 2012; Prymachuk et al., 2009; Wray et al., 2012, 2017), the following potential confounders were selected: age, gender, migrant

background, prior education, study route and family-work conflict. Migrant background was measured using the definition of Statistics Netherlands (CBS Statistics Netherlands, 2016): “a person with a migration background is someone of whom at least one parent was born abroad”. Prior education originally consisted of five categories. We merged these into three categories: (1) ‘higher general secondary education’, (2) ‘secondary vocational nursing training’, and (3) ‘pre-university education, higher vocational education or university education’. The study route was dichotomised into: (1) ‘full-time’ and (2) ‘part-time or study-work combination’. Family-work conflict was measured using the Netemeyer and Boles scale (Netemeyer et al., 1996). In this scale, family-work conflict is defined as: “a form of interrole conflict in which the general demands of, time devoted to, and strain created by the family, interfere with performing work-related responsibilities.” (p. 401). Reliability analysis of this scale revealed a Cronbach’s Alpha of 0.87.

3.6. Data analysis

At first, descriptive analyses for the study sample were performed for all outcomes, psychosocial work characteristics and potential confounders. For reasons of statistical power (to avoid nearly empty categories) the answer categories for violence, as well as for gossip and slander, were merged in the analysis to create three categories: (1) ‘never’, (2) ‘occasionally (a few times)’, and (3) ‘frequently (every month, every week, or every day)’. For the same reason, bullying was dichotomised into (1) ‘no’ and (2) ‘yes (a few times, every month, every week, or every day)’.

A check was performed on whether the variables were normally distributed. Correlations between all variables (outcomes, psychosocial work characteristics and confounders) were calculated using Spearman’s rho to check for multicollinearity ($r > 0.7$). Then a comparison between all outcomes, psychosocial work characteristics and confounders was made between groups with a baseline measurement and follow-up measurement on the one hand and those without a follow-up measurement (baseline measurement only) on the other hand.

We used a three-step procedure to build logistic regression models, with separate models for distress and intention to leave nursing education. Firstly, for each psychosocial work characteristic, the univariate association with the outcome measures was examined (crude effect sizes). Secondly, the potential confounders were added to the univariate models in a stepwise procedure. If the regression coefficient of the psychosocial work characteristics changed by more than 10%, the confounder was considered relevant and kept in the adjusted model. Finally, a multivariate model was constructed that included all psychosocial work characteristics, correcting for all relevant confounders. All analyses were performed using IBM SPSS version 26.0.

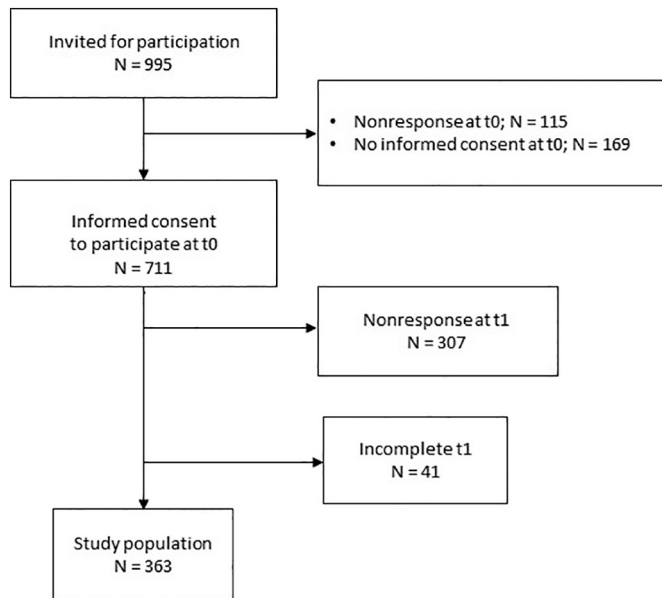


Fig. 2. Flow chart of included participants.

3.7. Ethical considerations

This study was conducted according to the principles of the Declaration of Helsinki, 64th World Medical Association General Assembly, Fortaleza, Brazil, October 2013, and in accordance with the Dutch Medical Research Involving Human Subjects Act. The Medical Ethical Review Committee of the Erasmus Medical Center in Rotterdam, the Netherlands approved the study (MEC number: FMS/sl/273789). The study complies with the Dutch Code of Conduct for Scientific Practice drawn up by the Association of Universities in the Netherlands (VSNU). Participants were informed about the study orally and in writing, before being approached for participation. All participants gave written informed consent.

4. Results

4.1. Characteristics of participants

Of the total of 995 third-year nursing students who were invited, 169 did not give permission and 115 did not respond to the invitation to participate in the cohort study. Of the total study population (N = 711), 51.1% (n = 363) responded at both baseline and follow-up (Fig. 2).

Table 1 shows that the group with a baseline measurement only, i.e. the nonresponse group, were significantly younger, were more likely to have started nursing education with the minimum requirements (higher

Table 1
Outcomes, psychosocial work characteristics and potential confounders of study and nonresponse group.

	Study group (N = 363) ^a		Nonresponse group (N = 348) ^b		p-value ^d
	% (n)		% (n)		
Outcomes at baseline^c					
Distress (% moderate to high distress)	44.1 (160)		47.1 (164)		0.41 ^f
Intention to leave (% intended to leave)	35.5 (129)		44.5 (155)		0.01 ^g
Outcomes at follow-up					
Distress (% moderate to high distress)	47.9 (174)		–		–
Intention to leave (% intended to leave)	27.8 (101)		–		–
Actual dropout (% dropped out)	1.9 (7)		4.9 (17)		0.03 ^h
Psychosocial work characteristics at baseline					
	mean (SD)	min–max	mean (SD)	min–max	
Psychological demands	2.8 (0.5)	1.3–4	2.9 (0.5)	1.5–4	0.08 ^e
Supervisor support	3.0 (0.6)	1–4	2.9 (0.7)	1–4	0.30 ^e
Co-worker support	3.1 (0.5)	1.8–4	3.1 (0.5)	1.5–4	0.29 ^e
Violence (never/occasionally/frequently)					
	% (n)		% (n)		
% occasionally	53.2 (193)		49.7 (173)		0.71 ^f
% frequently	15.4 (56)		16.4 (57)		
Bullying (% yes) no/yes	6.9 (25)		7.8 (27)		0.66 ^f
Gossip and slander					
% occasionally	40.2 (146)		40.2 (140)		0.09 ^f
% frequently	20.9 (76)		25.9 (90)		
Discrimination no/yes (% yes)	12.1 (44)		12.1 (42)		0.98 ^f
Potential confounders at baseline					
	mean (SD)	min–max	mean (SD)	min–max	
Age	24.0 (6.2)	19–55	23.0 (4.6)	19–53	0.02 ^g
	% (n)		% (n)		
Gender (% female)	91.2 (331)		89.1 (310)		0.35 ^f
Ethnicity (% migrant)	27.0 (98)		33.0 (115)		0.08 ^f
Prior education					0.005 ^f
% secondary vocational nursing training	31.4 (114)		26.2 (91)		
% higher general secondary education	49.6 (180)		61.2 (213)		
% pre-university education, higher vocational education, university education or other	19.0 (69)		12.6 (44)		
Study route (% full-time)	57.6 (209)		66.1 (230)		0.02 ^f
	mean (SD)	min–max	mean (SD)	min–max	
Family-work conflict 1–5 low-high	1.9 (0.8)	1–5	2.0 (0.8)	1–4.4	0.32 ^e

Bold data indicates the statistically significant differences.

^a The study group contained baseline and follow-up measurements.

^b The nonresponse group contained only baseline measurements; respondents were lost to follow-up. At follow-up, we were only able to collect data on study status.

^c To perform a study dropout analysis, the outcomes distress and intention to leave were also measured at baseline.

^d We measured whether the differences between the study and nonresponse groups scores were statistically significant (p-value < 0.05).

^e Independent sample t-test.

^f Chi-squared test.

^g Mann-Whitney U test.

^h Fisher's exact test.

general secondary education), and were more likely to be studying full-time. They scored significantly higher on intention to leave at baseline (35.5 ($n = 129$) versus 44.5 ($n = 155$), p -value = 0.01) and actual dropout at follow-up (1.9% ($n = 7$) versus 4.9% ($n = 17$), p -value = 0.03) but did not differ in distress scores at baseline.

4.2. Results for distress and intention to leave

In the crude univariate model for distress (Table 2) high psychological demands (OR = 1.58, CI: 1.05–2.37) and frequent exposure to violence (OR = 2.66, 95% CI: 1.37–5.16) were significantly associated with distress. In the adjusted models, after including family-work conflict, only frequent exposure to violence (OR = 2.52, 95% CI: 1.29–4.92) was significantly associated with distress, while high psychological demands was not. In the multivariate model for distress, high psychological demands (OR = 1.63, 95% CI: 1.05–2.52) and frequent exposure to violence (OR = 3.02, 95% CI: 1.48–6.19) were significantly associated with distress. Supervisor support, co-worker support, occasional exposure to violence, bullying, occasional and frequent exposure to gossip

and slander, and discrimination were not significantly associated with distress.

In the crude univariate model for intention to leave (Table 3), supervisor support (OR = 0.52, 95% CI: 0.35–0.76), co-worker support (OR = 0.39, 95% CI: 0.23–0.69) and being discriminated against (OR = 1.97, CI: 1.03–3.78) were significantly associated with intention to leave. After including family-work conflict in the adjusted model, supervisor support (OR = 0.54, 95% CI: 0.36–0.80) and co-worker support (OR = 0.41, 95% CI: 0.24–0.72) still showed a significant association with intention to leave (i.e. both reduced the intention to leave), but being discriminated against (OR = 1.87, CI: 0.97–3.61) did not. Finally, in the multivariate model, only co-worker support (OR = 0.50, 95% CI: 0.25–0.97) remained significantly associated, as a protective factor, with an intention to leave one year later. Psychological demands, violence, gossip and slander, and bullying were not significantly associated with intention to leave.

Table 2

Crude univariate, adjusted univariate and adjusted multivariate models for distress by logistic regression analysis ($N = 363$).

Psychosocial work characteristics	Distress after one-year follow-up					
	Crude univariate		Adjusted ^a univariate		Adjusted multivariate	
	OR	CI	OR	CI	OR	CI
Psychological demands	1.58[*]	1.05–2.37	1.48	0.98–2.24	1.63[*]	1.05–2.52
Supervisor support	0.96	0.68–1.35	1.04	0.73–1.48	0.99	0.64–1.52
Co-worker support	1.21	0.76–1.91	1.34	0.84–2.14	1.47	0.82–2.63
Violence (ref = no violence)						
Occasionally	1.35	0.84–2.15	1.30	0.81–2.09	1.28	0.79–2.07
Frequently	2.66^{**}	1.37–5.16	2.52^{**}	1.29–4.92	3.02^{**}	1.48–6.19
Bullying (ref = not being bullied)						
Being bullied	0.71	0.31–1.62	0.53	0.22–1.28	0.45	0.16–1.26
Gossip/slander (ref = no gossip./sl.)						
Occasionally	1.20	0.76–1.91	1.18	0.74–1.89	1.19	0.73–1.94
Frequently	1.00	0.57–1.75	0.93	0.53–1.65	0.95	0.49–1.84
Discrimination (ref = no discrim.)						
Being discriminated against	0.89	0.47–1.68	0.82	0.43–1.56	0.95	0.46–1.96

Abbreviations: OR, odds ratio; CI, confidence interval; ref., reference group.

Bold data indicates statistically significant associations.

* $p < 0.05$.

** $p < 0.01$.

^a Adjusted for family-work conflict.

Table 3

Crude univariate, adjusted univariate and adjusted multivariate models for intention to leave by logistic regression analysis ($N = 363$).

Psychosocial work characteristics	Intention to leave after one-year follow-up					
	Crude univariate		Adjusted ^a univariate		Adjusted multivariate	
	OR	CI	OR	CI	OR	CI
Psychological demands	0.87	0.55–1.35	0.81	0.52–1.28	0.65	0.40–1.08
Supervisor support	0.52^{**}	0.35–0.76	0.54^{**}	0.36–0.80	0.62	0.39–1.00
Co-worker support	0.39^{**}	0.23–0.69	0.41^{**}	0.24–0.72	0.50[*]	0.25–0.97
Violence (ref = no violence)						
Occasionally	0.86	0.51–1.46	0.84	0.49–1.42	0.86	0.50–1.47
Frequently	1.87	0.95–3.66	1.77	0.90–3.50	1.70	0.81–3.55
Bullying (ref = not being bullied)						
Being bullied	2.17	0.95–4.94	1.89	0.81–4.42	1.24	0.44–3.53
Gossip/slander (ref = no gossip./sl.)						
Occasionally	0.89	0.53–1.50	0.87	0.52–1.48	0.72	0.42–1.25
Frequently	1.28	0.70–2.35	1.22	0.67–2.26	0.64	0.31–1.33
Discrimination (ref = no discrim.)						
Being discriminated against	1.97[*]	1.03–3.78	1.87	0.97–3.61	1.66	0.79–3.50

Abbreviations: OR, odds ratio; CI, confidence interval; ref., reference group.

Bold data indicates statistically significant associations.

* $p < 0.05$.

** $p < 0.01$.

^a Adjusted for family-work conflict.

5. Discussion

This prospective cohort study reveals that psychosocial work characteristics are associated with both distress and intention to leave. Psychological demands and frequent exposure to violence are risk factors for distress, and co-worker support is a protective factor reducing the intention to leave nursing education in year four, the last stage of the programme.

5.1. Distress

Previous research revealed that nursing students, despite their supernumerary status, are sometimes deployed as workers (e.g., Eick et al., 2012). This seems to be a short-term solution for nursing shortages. In the long run this might have an unfavourable effect, as our study shows; high psychological demands in the third year of study were significantly associated with distress a year later.

In the present study, supervisor support and co-worker support were not associated with feelings of distress. This is not in line with the findings of Karaca et al. (2019), who found in their case-control study among 516 nursing students that social support was a protective factor for the maintenance of mental health. However, in that study mental health was measured using the General Health Questionnaire [GHQ] (Goldberg and Hillier, 1979), which is a broader concept. Furthermore, a different concept of social support was used: support from family, friends and significant others rather than support at work.

According to the Job Demands-Resources model (Bakker and Demerouti, 2007), support is a resource that can counteract the negative effects of psychological demands. In our multivariate model of distress, we found no indication of a unique contribution by social support in explaining distress in addition to psychological demands. Future research is needed into the interaction effect or buffer effect of social support in the association between psychological demands and nursing students' distress.

The impact of offensive behaviours (exposure to threats or violence, bullying, gossip and slander, and discrimination) on employee wellbeing within healthcare organisations has been studied extensively. Our findings regarding the association between violence and distress are consistent with previous studies (Clausen et al., 2012; Hogh and Viitasara, 2005; Moloney et al., 2018) but not for bullying (Clausen et al., 2012). In the retrospective longitudinal study of Clausen et al. (2012) among 9520 female employees in the Danish care services for the elderly, employees frequently exposed to threats, violence and bullying had a significantly increased risk of long-term sickness absence, an outcome related to distress. The systematic review of Hogh and Viitasara (2005) demonstrates in 5 of the 16 included studies that being subjected to violence at work (mainly nurses in psychiatric hospitals) have mental health consequences such as psychological distress or symptoms of Posttraumatic Stress Disorder. Moloney et al. (2018) found in a cross-sectional study surveying 2876 registered nurses in New Zealand that an exposure to aggressive and troublesome patients resulted in increases in burnout, a condition related to distress. An explanation for not finding an association between bullying and distress might be the low prevalence of bullying at baseline or the fact that nursing students only spend a short time in their clinical placement.

5.2. Intention to leave

The crude and adjusted univariate models suggest that both supervisor support and co-worker support are protective factors for intending to leave. However, in the multivariate model only the co-worker support effect remained. A methodological explanation might be that supervisor support and co-worker support explain in part the same variation in intention to leave. A practical explanation might be that nowadays nursing students in the Netherlands do not work on a daily basis with their supervisor, making the support of co-workers a more important

factor for staying in the programme. Alternatively, the supervisor role may be fulfilled by more than one colleague. The importance of support in clinical placements in preventing an intention to leave corresponds with the cross-sectional study of Ujváriné et al. (2011) among 381 fourth-year Hungarian nursing students. In their model for intention to graduate as a nurse (the opposite of an intention to leave nursing education), they found a significant association with supervisor support and co-worker support (in their study referred to as preceptor support and clinical staff support). Ujváriné et al. (2011) found an even stronger association for faculty support, which was not measured in the present study.

The systematic review of Eick et al. (2012) on dropout in nursing students confirms that support at clinical placement is an important factor (Brodie et al., 2004; Glogowska et al., 2007; Last and Fulbrook, 2003; Ujváriné et al., 2011; Wray et al., 2012). Although this review only included qualitative or cross-sectional study designs, more recent qualitative studies point in the same direction (e.g., Bakker et al., 2019; Ten Hoeve et al., 2017).

We did not find associations between exposure to violence and bullying and intention to leave. This is not consistent with earlier studies among graduate nurses. Both Bambi et al. (2019) and Moloney et al. (2018) found in their cross-sectional studies among health workers (nurses, head nurses and nurse managers) that bullying by peers or violence by patients were associated with an intention to leave. Hogh et al. (2011, 2012) found associations between bullying and dropout of health care trainees (assistants and helpers). An explanation for not finding an association between bullying or violence and intention to leave might be the difference in research population, outcomes and used measurement instruments.

5.3. Limitations

As described in the protocol paper, the main outcome of the the SPRiNG cohort study was actual dropout (Bakker et al., 2018). As the occurrence of dropout in the initial study population (N = 711) was low (3.4%), we were unable to investigate associations between actual dropout and psychosocial work characteristics. Instead, distress and intention to leave nursing education were chosen as proxies for actual dropout. Nonresponse analyses revealed that both having an intention to leave and the actual dropout rate of nursing students in our study group were significantly lower compared to those without data for the one-year follow-up. This selective nonresponse might have led to an underestimation of the strength of the association between psychosocial work characteristics and intention to leave.

The questionnaires on psychosocial work characteristics were validated for employees in health care, among others for nurses, but not for nursing students. Since nursing students in their final phase of their training are comparable to employees, the influence is expected to be limited.

In contrast to previous retrospective cohort studies on nursing student dropout (e.g. Pryjmachuk et al., 2009; Wray et al., 2012), a strength of this study was its prospective design, which enabled us to focus on modifiable psychosocial work characteristics. Furthermore, the longitudinal design enabled us to rule out reverse causation. Lastly, the rather high participation rate of nursing students at baseline (71.5%) was a strength, but the selective nonresponse at follow-up was a limitation. In the SPRiNG cohort study, demotivated students, students who were behind with their degree programme or students with an intention to leave nursing education might have been less willing to participate. The statistically significant higher actual dropout and intention to leave at baseline in the nonresponse group, compared to the study group, points in this direction. Hence, in this study we might have suffered from the so-called 'healthy worker effect' (Last, 2001). This might have led to an underestimation of the effects because the study group was a relatively well-functioning group compared to the nonresponse group.

6. Conclusion

This prospective cohort study reveals that some psychosocial work characteristics are associated with distress and others with intending to leave nursing education at a late stage of the educational programme. High psychological demands, which means working fast, hard, without enough time and with conflicting demands and frequently experiencing threats of and physical violence, are risk factors for distress. For intention to leave nursing education, co-worker support in particular is a protective factor.

6.1. Implications

The present study provides useful information for universities of applied sciences and healthcare organisations involved in nursing education or clinical placements; this information can help them improve the psychosocial work environment of nursing students. In future research it might also be interesting to look at changes in distress and intention to leave over time. Nurses involved in guiding and mentoring nursing students in a clinical setting could consider ways to further improve co-worker support alongside supervisor support. In order to prevent anxiety and depression due to high levels of distress, attention should be paid to the psychological demands on nursing students during clinical placements and offensive behaviours such as nursing students' exposure to violence. Nurse managers must be made aware of the long-term effects of high psychological demands on nursing students in terms of developing distress during clinical placements.

In the multivariate model for intention to leave, supervisor support was no longer a statistically significant factor. This does not imply that supervisor support is less important than co-worker support; it might imply that the psychosocial safety climate within a clinical ward or nursing team is important in preventing intended or actual dropout in nursing students. Improving psychosocial work characteristics, through interventions to improve co-worker and supervisor support for nursing students, seems to be necessary.

In this study we looked at several forms of offensive behaviours, from patients and their relatives but also from co-workers (nurses, nurse managers, nursing assistants or medical doctors). General training in the prevention and handling of conflicts, aggression and violence, might improve the psychosocial work climate for nursing students, as well as more specific training in recognising and handling agitation related to work stress in supervisors, co-workers and patients' relatives, or disease-related aggression from patients (e.g., Gilley et al., 1997).

In the present study, presenting the SPRiNG questionnaire as part of the curriculum during lessons that address student's professional development and research skills gave a better response than would probably have been obtained if the questionnaire had been sent separately from the educational programme. In order to include nursing students experiencing study delays, who are absent due to sickness or who are demotivated — a group that might be less willing to participate in research on study dropout — we recommend starting up the cohort earlier in the programme, preferably at the beginning of the first year. For students lost to follow-up, at least data recorded in the administrative systems can be used.

CRedit authorship contribution statement

PR and HM initiated and designed the SPRiNG cohort study. EB and JK collected the data. CB, PR and EB designed this sub study. EB performed all the analyses under supervision of CB and PR. EB produced the first draft of the present article with guidance from CB, PR, AF and AvdB. All authors (EB, PR, JK, HM, AF, AvdB, CB) contributed substantially to the manuscript and critically revised the content. All authors read and approved the final version of the manuscript.

Declaration of competing interest

No conflict of interest has been declared by the authors.

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