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RESEARCH ARTICLE

The Effects of Nursing Satisfaction and Turnover Cognitions on Patient Attitudes and Outcomes: A Three-Level Multisource Study

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Objective. To explore antecedents and outcomes of nurse self-reported job satisfaction and dissatisfaction-based turnover cognitions, theorizing (using Self-Determination Theory) that leaders can foster work conditions that help fulfill innate needs, thereby fostering satisfaction of nurses and patients, and reducing adverse events.

Data Sources/Study Setting. Primary and secondary data were collected within a 4-month period in 2015, from 2,596 nurses in 110 Army treatment facilities (hospitals and clinics) across 35 health care systems.

Data Collection/Extraction. We collected individual nurse responses to the Practice Environment Scale-Nursing Work Index, in addition to aggregated archival data from the same timeframe, including both facility-level patient satisfaction records (the Army Provider Level Satisfaction Survey) and health care system-level adverse events records (provided by the Army Programming, Analysis, and Evaluation office).

Principal Findings. Five predictors of nurse satisfaction and turnover cognitions emerged—supportive leadership, staffing levels, nurse–physician teamwork, adoption of nursing care practice, and advancement opportunities. Aggregated nurse satisfaction was the most consistent predictor of both patient satisfaction and adverse events.

Conclusion. These findings provide evidence of the importance of nurse attitudes in improving perceived and actual performance across facilities and health care systems; in addition to practical steps, managers can take to improve satisfaction and retention.

Key Words. Nurse satisfaction, turnover cognitions, self-determination theory, adverse events, leadership, patient satisfaction, resources

Scholars agree that job satisfaction is an important predictor of employee performance (Judge et al. 2001), which is a foundation for organizational performance and safety (Hofmann and Mark 2006). We explore antecedents and outcomes of nursing satisfaction and dissatisfaction-based turnover cognitions

in a military health care setting to better understand the nuances and organizational-level effects of these attitudes.

As the largest single group of health care providers (nearly 4 million in the United States), nurses represent a significant portion of the health care workforce (Auerbach, Buerhaus, and Staiger 2014) and have a significant impact on quality of care. The need for new and replacement nurses will reach 1.05 million by 2022 (Lockard and Wolf 2012). Nursing dissatisfaction contributes to turnover and nursing shortages (Duffield et al. 2014), which, in turn, adversely affect patient outcomes (Aiken, Clarke, and Sloane 2002) and the financial viability of health care organizations (Jones and Gates 2007). Given the critical shortage of nurses and demands of the profession, satisfaction remains a salient concern (Ma, Samuels, and Alexander 2003).

We add to this work in an important context, the Military Healthcare System, which provides a valuable opportunity to examine our hypotheses within widely dispersed organizational settings with a consistent set of operational characteristics (e.g., HRM protocols). Military hospitals are similar to the private sector in many ways, including following Joint Commission accreditation criteria. Thus, studies of the military nursing environment can provide interesting insights into nursing behaviors that are generalizable, but with less variation across facilities.

We aim to contribute to theory on satisfaction and turnover by comparing three distinct forms of nurse satisfaction and dissatisfaction—self-reported satisfaction and dissatisfaction-based desire to quit and intention to quit—in conjunction with individual-level predictors and organizational-level outcomes. We apply turnover theory to conceptualize dissatisfaction-motivated desires and plans regarding the employee's departure from the organization. We also ground our work in Self-Determination Theory (SDT), which posits that the work environment satisfies three innate psychological needs (competence, autonomy, and relatedness), energizing and motivating individuals to perform while increasing positive affect (Deci and Ryan 2000, 2008; Houston et al. 2012; McHugh et al. 2013). Finally, we also contribute to research on health care organizational performance by exploring linkages between nurse attitudes and both patient and clinical outcomes. Although the job satisfaction–performance link is clear for individuals (Judge et al. 2001), our work

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builds on Hofmann and Mark's (2006) investigation of nurse attitudes, patient attitudes, and adverse events to expose organizational-level implications.

Theoretical Background for Job Satisfaction and Turnover Cognitions

Most definitions of job satisfaction focus on evaluative feelings an individual has toward the job (Judge et al. 2007). In addition to this classic form, we explore two finer-grained indicators of dissatisfaction, borrowing from research on the Employment Opportunities Index (EOI) and turnover theory (Griffeth et al. 2005). We label these constructs "dissatisfaction-based turnover cognitions" because they are rooted in dissatisfaction with a specific aspect of the work environment. Desire to quit reflects wanting to leave the organization (March and Simon 1958; Griffeth et al. 2005), independent of any solid plans to do so, whereas intention to quit reflects short-term plans to leave (Mobley 1977; Ajzen 1985; Griffeth, Hom, and Gaertner 2000; Allen, Weeks, and Moffitt 2005; Griffeth et al. 2005; Steel and Lounsbury 2009). Turnover cognitions may commence well before an employee actually leaves and are influenced by attitudes such as satisfaction or commitment (Tett and Meyer 1993; Harrison, Newman, and Roth 2006). When only considered generally, these could be motivated by any number of reasons (Griffeth et al. 2005), but when rooted in dissatisfaction, they may have more serious implications, and they may be addressed by resolving the sources of dissatisfaction.

Predictors

Building on research that positions intrinsic need satisfaction (i.e., needs for autonomy, relatedness, and competence; Deci and Ryan 2000) as a driver of satisfaction and turnover cognitions (Deci, Connell, and Ryan 1989; Hofmann and Mark 2006), and numerous studies examining predictors of nurse satisfaction (Lu, While, and Barriball 2005; Hofmann and Mark 2006; Sellgren, Ekvall, and Tomson 2007; Zurmehly, Martin, and Fitzpatrick 2009; Applebaum et al. 2010; Han and Jekel 2011; Lu et al. 2012), we focus on five workplace factors that align with fulfillment of needs and are priorities in the health care context: supportive leadership, staffing adequacy, nurse–physician teamwork, nursing care practice, and advancement opportunities. According to SDT, when the psychological needs of autonomy, competence, and relatedness are met, individuals experience positive affect, energy, and motivation to

fulfill one's job obligations (Deci, Connell, and Ryan 1989; Ryan and Deci 2000). Autonomy is the need to act under one's own discretion, competence represents the degree to which one feels capable performing the job, and relatedness is the level of interpersonal connection with coworkers.

First, leadership is a well-known determinant of quality of work life (Monnot and Beehr 2014). Supportive leadership practices demonstrate the leader is on the employee's side, equipping him or her to perform and engendering positive attitudes (Eisenberger et al. 2002; Allen, Shore, and Griffeth 2003; Ilies, Nahrgang, and Morgeson 2007; Liao and Chuang 2007; Kauppila 2015). We expect supportive leadership predicts nurse satisfaction because it addresses autonomy, as nurses feel empowered to act independently in making decisions (Spetz et al. 2016); competence, as they feel well equipped with necessary resources; and relatedness, as they form relationships with leaders (Kottke and Sharafinski 1988; Hofmann and Mark 2006; Jokisaari and Nurmi 2009). In contrast, dissatisfaction-based turnover cognitions are likely to ensue in the absence of leadership support, leading a nurse to consider leaving the organization in favor of a more intrinsically satisfying and supportive environment.

Second, staffing adequacy is also an indicator of sufficient resources to do one's job well (Hobfoll 1989). When nurse-to-patient ratios are reasonable, coworkers can assist each other and nurses can avoid excessive overtime, thus fulfilling innate needs for competence (Aiken et al. 2012; Hayes et al. 2012). On the flip side, when staffing is insufficient, nurses are overburdened during each shift, under-resourced to do their job, and may feel obligated to work extra shifts. These conditions likely decrease feelings of competence, leading to dissatisfaction-based turnover cognitions in the midst of ensuing exhaustion and discontentment.

Third, teamwork represents how well nurses and physicians work together, communicate, and respect one another (Streeton et al. 2016). This occurs between two distinct job roles and hierarchical levels, strongly affecting nurse perceptions and patient outcomes (Ajeigbe, McNeese-Smith, Leach, and Phillips 2013); communication failures among nurses and physicians account for 70 percent of adverse events (Eggertson 2012). Physicians typically hold higher-power positions than nurses, so good teamwork may reflect additional resource allocations from these informal leaders (Drach-Zahavy 2004). Thus, we expect teamwork fulfills needs for both competence (signifying professional respect and available resources from physicians) and relatedness (signifying healthy work relationships; Aiken et al. 2012). In contrast, when teamwork between nurses and physicians is poor, nurses may feel

underappreciated and perhaps under-resourced. Such nurses are likely to think about pursuing other job opportunities where they may have better working relationships with physicians.

Fourth, nursing care practice is the extent to which patient care is based on nurse expertise and best practices. This is also a representation of input afforded nurses and their profession, or respect by colleagues. Research confirms the importance of nurse participation in shared decision-making for resulting quality of care, job satisfaction, and retention (Mark, Salyer, and Wan 2003; Murray et al. 2016). These processes are likely to satisfy a nurse's needs for autonomy and competence, leading to empowerment and a sense of being entrusted to act according to one's professional training and expertise. Conversely, nursing care practice is lower, nurses are likely to feel less empowered and respected, leading to feelings of dissatisfaction and thoughts of leaving.

Finally, advancement opportunities include professional development, promotion, and voice in the organization (i.e., higher visibility). Such empowerment opportunities are linked to satisfaction and reduced turnover (Fried and Ferris 1987; Egan, Yang, and Bartlett 2004; Holland et al. 2011; Chamblee et al. 2015), particularly among high performers (Hausknecht, Rodda, and Howard 2009). Participating in decision-making at the organizational level is different than in patient care, but it likely has similar effects on satisfaction (Murray et al. 2016) because it fulfills the needs of autonomy and competence. Nurses who see a clear path for advancement, including having input in decisions, likely feel a sense of empowerment and trust that they can make an impact on the organization and their own career. Nurses who do not see a clear path for advancement or have input on important decisions are likely to feel frustrated and limited, developing dissatisfaction-based turnover cognitions.

Hypotheses 1–3 (a–e): Leadership (a), staffing adequacy (b), teamwork between nurses and physicians (c), nursing care practice (d), and advancement opportunities (e) are positively associated with self-reported satisfaction (1) and negatively associated with dissatisfaction-based desire (2) and intention (3) to quit at the individual level.

Theoretical Background for Patient Satisfaction

In addition to the relationships just described, we were also interested in the association between aggregated nurse attitudes (satisfaction and

dissatisfaction-based turnover cognitions) and aggregated patient attitudes at the facility level (Level 2; hospitals and clinics). Patient satisfaction includes reactions by patients to the health care service experience, including service delivery and providers (Manary et al. 2013), and we explore this concept as the overall percentage of favorable patient responses to a satisfaction survey. Patient satisfaction is linked to a number of important outcomes, including loyalty to a facility and adherence to physician recommendations (Rao, Weinberger, and Kroenke 2000; Safran et al. 2001; Mark, Salyer, and Wan 2003; Sequist et al. 2008; Zolnierek and DiMatteo 2009; Murray et al. 2016). It is also widely utilized as an indicator of overall quality of care (Browne et al. 2010; Fenton et al. 2012). We explore six patient perceptions—willingness to recommend, satisfaction with nurses, ability to see provider, knowledge to make healthy choices, satisfaction with health care overall, and satisfaction with current visit.

Nurse and Patient Satisfaction

Per SDT, satisfied nurses who are focused on their current job are likely energized and motivated in patient interactions (Deci and Ryan 2008), which has an aggregate effect on patients. Aiken et al. (2012) found a strong link between nurse satisfaction and patient perceptions, complementing findings that nurse satisfaction is an important contributing factor (Otani, Harris, and Tierney 2003; Vahey et al. 2004; Kutney-Lee et al. 2009). We aim to replicate this with finer-grained operationalizations of nurse and patient satisfaction at the facility level. Namely, as nurses within a facility experience higher levels of satisfaction and less dissatisfaction-based turnover cognitions, they likely interact with patients in a more positive way, resulting in positive patient perceptions (Pelletier and Stichler 2014). Conversely, when nurses are less satisfied and/or have more thoughts about leaving, we expect they will be more distracted, short-tempered, and less attentive overall when managing patients. Thus, we predict the following at the facility level:

Hypotheses 4–9 (a–c): Aggregated nurse satisfaction (a) is positively and aggregated nurse dissatisfaction-based desire (b) and intention (c) to quit are negatively related to aggregated patient likelihood to recommend (4), satisfaction with nurses (5), ability to see provider (6), knowledge to make healthy choices (7), satisfaction with health care overall (8), and satisfaction with current visit (9) at the facility level.

Theoretical Background for Adverse Events

Nurse attitudes and turnover cognitions also matter for adverse events (i.e., harm to patients), which are considered the third leading cause of the death in the United States (Makary and Daniel 2016). Recent evaluations estimate the number of premature deaths associated with preventable adverse events at more than 400,000 per year, and serious harm is likely 10- to 20-fold more common (James 2013). The Joint Commission evaluates health care facilities in terms of the number of adverse events, comparing against national targets for a wide range of areas. We had access to records for two of these areas at the facility level (Level 3): patient falls and medication errors, including both with and without injury, to maximize accuracy of reporting (Currie 2008).

Nurse Satisfaction and Adverse Events

Nurses help insure patient safety, including prevention of falls and medication errors. However, even in the best of conditions, caring for patients is challenging; nurse staffing levels, heavy workload, stress, and burnout all affect the extent to which nurses can safely and effectively manage patient care (Page 2004; Carayon and Gurses 2008; Aiken et al. 2012; Laschinger 2014). When nurses experience dissatisfaction, they likely have fewer resources to invest in doing their work carefully, instead experiencing exhaustion and aversion to patients (Biaggi, Peter, and Ulich 2003). Higher nurse exhaustion is associated with increased patient falls and medication errors (Van Bogaert et al. 2014). Applying SDT, in health care systems where more nurses are dissatisfied and thinking about leaving their jobs, those nurses are likely to feel that way at least partly because their basic intrinsic needs are unmet by their institutions and leadership. Subsequently, such nurses are likely to experience depleted motivation and energy to invest in executing the job carefully (Hofmann and Mark 2006; Deci and Ryan 2008; Purdy et al. 2010; Duffield et al. 2011). When more nurses across a health care system experience these negative attitudes, we predict more adverse events will occur within that system. Thus, we predict the following as our Level-3 hypotheses:

Hypotheses 10–13 (a–c): Aggregated nurse satisfaction (a) is negatively and aggregated nurse dissatisfaction-based desire (b) and intention (c) to quit are positively related to aggregated fall rates (10), falls with injury rates (11), medication error rates (12), and medication errors with injury rates (13) at the health care system level.

METHOD

Participants and Procedure

Leaders of all 206 Army military treatment facilities in the United States (MTFs) asked registered nurses (RNs) and licensed practical nurses (LPNs) engaged in direct patient care to complete an online survey using the Practice Environment Scale-Nursing Work Index (PES-NWI; $N = 2{,}839$, 18 percent response rate, average 23.6 nurses per facility). This was available to us as individual-level data, which we used for analysis at Levels 1, 2, and 3 after aggregation. The Army Provider Level Satisfaction Survey (APLSS), a 27-question survey administered by the Army, gauged patient satisfaction at the MTF level via paper and email forms following outpatient visits. Our data are aggregated from surveys completed by 141,565 patients at 110 MTFs during the same time period as the nursing survey (typical response rate is 35 percent; Military Health System Review, 2014). These data were only available as facility-level (Level-2) records. Adverse event data for 35 Army health care systems were provided by the Army Programming, Analysis, and Evaluation office for the same time period (Level-3 data).

Measures

We included measurements and analysis at three different levels to test our hypotheses. For the individual-level (Level-1) analyses (Hypotheses 1–3), we used individual-level nurse perceptions as both predictors and outcomes. The PES-NWI is a valid and reliable tool recommended for military and civilian health settings (Lake 2002; Lang, Patrician, and Steele 2012). For the facility-level (Level-2) analyses (Hypotheses 4–9), we used six aggregated patient satisfaction variables from the APLSS, which was available for outpatient facilities only. We included aggregated nurse survey responses as predictors of patient satisfaction at Level 2. For health care system-level (Level 3) analyses (Hypotheses 10–13), we used four adverse event indicators and aggregated nurse survey responses as predictors. At Level 3, we had data from all types of facilities (aggregated to the system level), including hospitals and clinics that offer inpatient-only, outpatient-only, and both inpatient/outpatient services.

Nurse Perceptions. Nurses answered one question to assess self-reported satisfaction (4 = *satisfied*): "Overall, how satisfied are you with your current job?"

All workplace factors were also measured using a 4-point response scale (4 = *strongly agree*), with instructions to consider the degree to which each statement was true of the workplace. *Supportive leadership* included eight questions (α = .91; e.g., "A supervisory staff that is supportive of the nurses"). *Staffing adequacy* included three questions (α = .79; e.g., "Enough registered nurses to provide quality patient care"). *Nurse–physician teamwork* included three questions (α = .86; e.g., "Physicians and nurses have good working relationships"). *Nursing care practice* included three questions (α = .77; "Written, up-to-date nursing care plans for all patients"). *Advancement opportunities* included eight questions (α = .90; e.g., "Active staff development or continuing education programs for nurses").

Dissatisfaction-Based Desire and Intention to Quit. We calculated turnover cognitions using nurse responses to two separate items: "If you could, regardless of military obligations (yours or your spouse's) would you leave your current job?" (Desire) and "Do you plan to leave your current nursing position?" (Intention). For each, if the answer was "yes," then respondents were asked the follow-up: "What is the primary reason you would leave your current position?" with 20 response options. We coded a dummy variable "1" if the answer to the follow-up question was one of the five dissatisfaction choices: dissatisfied with compensation, management, schedule, team members, or work environment. For the Level-2 and Level-3 analyses, we calculated the percentage of nurses with a score of 1 out of the total nurses responding for each facility at each level of analysis.

Patient Satisfaction. Patient satisfaction reflects the percentage of patients for each outpatient facility that reported in the top two (most favorable) response categories for each 1-item measure (O'Malley et al. 2005; Isaac et al. 2010). Aggregation to the facility level is common in the patient satisfaction literature (Stimpfel et al. 2015; Winpenny et al. 2016). The items were: "Would you recommend <facility> to your family or friends?"; "Overall, how satisfied to you feel about the nurses you saw during your visit?"; "In general, I am able to see my provider(s) when needed"; "I feel confident that I have the knowledge to make healthy choices and informed medical decisions"; "Overall, how satisfied are you with your health care?"; and "Everything considered, how satisfied were you with <facility> during this visit?" The first item used a 4-point response scale, and all others used a 5-point scale. We only had aggregated, percent-

favorable data for patients at the level of each outpatient facility, not individual-level patient responses.

Adverse Events. Health care systems reported the number of falls and medication errors (with and without injury) per 1,000 inpatient days (for inpatient units) or per 1,000 outpatient encounters (for outpatient units). We collected this data at the system-level only. We tested the Level-3 hypotheses separately, using each of these three different categories of facilities (inpatient-only, outpatient-only, or both), to compare trends.

Controls. At Level 1, we used three binary control variables. *Nurse type* reflects RN (70 percent) or LPN (30 percent). LPNs have higher job turnover rates than registered nurses (Castle and Engberg 2006), suggesting that differences in satisfaction probably also exist. *Military status* reflects civilian (60 percent) or active duty military (40 percent). We included this because there are differences in working hours (i.e., military have longer workweeks), burnout (Patrician, Shang, and Lake 2010), and job movement (i.e., military switch jobs more). Finally, we included *management status* (management: 8 percent or nonmanagement: 92 percent) because front-line nurses have different perceptions about the work environment than managers (Gormley 2011). At Level 2, we included facility size, which was captured as the total number of enrolled beneficiaries in TriCare (i.e., the number of patients served by that facility). We did not include any additional control variables at Level 3, out of concern for power.

Analytic Strategy

First, we used CFA to confirm fit for the Level-1 independent variables. The five-factor model exhibited acceptable fit (χ^2 = 3,701.201 (265), p = .0000; CFI = .91; RMSEA = .07, SRMR = .05, AIC = 139,517.20 (Hu and Bentler 1998). Standardized factor loadings ranged from .53 to .85. Additionally, we conducted an exploratory factor analysis using Promax rotation, which revealed five items that had standardized cross-loadings between .25 and .37 on nonhypothesized factors, but all of these were lower than the loading on the hypothesized factor.

Next, we tested for the threat of common method variance (CMV) and multicollinearity at Level 1 among the nurse-reported variables. The variance inflation factor (VIF) and tolerance values were acceptable (VIF < 10 and

Tolerance > .10; Belsley, Kuh, and Welsch 2005), suggesting that multicollinearity might not be a concern. But we also directly tested for CMV, using CFA, allowing every item to load on its hypothesized construct and also on an uncorrelated latent factor, representing the method (Williams, Cote, and Buckley 1989; Podsakoff, MacKenzie, and Podsakoff 2012). We included all five predictors and self-reported satisfaction in these tests. Model fit did not improve with the addition of the method factor (AIC = 149,702 with method, compared to 144,685 without method), but the average variance explained by method was 39 percent (vs. 20 percent by constructs), suggesting a noticeable threat of CMV when considering all predictors together. Thus, we proceeded by including one independent variable at a time in the Level-1 analyses.

Next, to assess whether aggregation was justified from Level 1 to Level 2 and from Level 1 to Level 3 (system level), we computed r_{wg} (using the expected variance for the uniform distribution for a four-point response scale, which is 1.25 (James, Demaree, and Wolf 1984). We also computed ICC(1) and ICC(2), which represent the proportion of variance in each variable explained by group membership and the reliability of the group means, respectively (Bliese 2000). Although we did not use the Level-1 predictors in aggregated form, we report the level of agreement and reliability ($r_{wg(j)}$ and ICC) present in each facility and health care system on the five self-report predictors in addition to nurse satisfaction, averaging across units (see Table 1). These statistics combined with the conceptual nature of the variables suggest that aggregation is appropriate (LeBreton and Senter 2007). We did not calculate these values for dissatisfaction-based desire or intention to quit because we were not interested in agreement between respondents, but rather in overall percentages of nurses who desire or intend to leave.

At Levels 1 and 2, we used multilevel modeling (random intercepts) to test all hypotheses. For self-reported satisfaction (a continuous dependent variable) at Level 1, we used multilevel mixed effects modeling and for dissatisfaction-based desire and intention to quit, we used multilevel logistic regression (binary outcomes). For all Level-3 analyses, we used ordinary least squares regression.

RESULTS

Descriptive statistics for variables at each level are presented in Table 1. See online appendix Tables A1 and A2 for correlations of study variables at each level.

Table 1: Descriptive Statistics of Study Variables

	Level 1		*Level 2*		*Level 3*		
Variable	*Mean*	*SD*	*Mean*	*SD*	*Mean/SD*	*Mean/SD*	*Mean/SD*
Nurse attitude variables modeled at all levels					Inpatient/ outpatient combined ($N = 17$)	Inpatient only ($N = 13$)	Outpatient only ($N = 32$)
Self-reported satisfaction[†]	3.11	0.86	3.17	0.42	3.12/0.13	3.09/0.15	3.20/0.10
Dissatisfaction-based desire to quit[‡]	0.25	0.44	33.88	24.99	21.22/7.16	22.99/9.47	19.51/5.82
Dissatisfaction-based intention to quit[‡]	0.10	0.30	14.27	12.81	9.46/3.99	10.85/3.08	11.22/2.89
Leadership support[†]	2.93	0.75	2.96	0.43			
Staffing adequacy[†]	2.80	0.82	2.79	0.52			
Nurse–physician teamwork[†]	3.25	0.67	3.27	0.41			
Nursing care practice[†]	2.98	0.72	2.90	0.43			
Advancement opportunities[†]	2.71	0.70	2.65	0.42			
Level 1 Variables							
Nurse type[§]	0.70	0.46					
Military status[¶]	0.40	0.49					
Management[‖]	0.08	0.27					
Level 2 Variables[††]							
Patient willingness to recommend hospital to friends			70.46	12.49			
Patient satisfaction with nurses			95.29	3.93			
Patient ability to see provider when needed			83.52	8.17			
Patient knowledge to make healthy choices			93.14	3.87			
Patient satisfaction with health care overall			91.52	5.10			
Patient satisfaction with current visit			94.31	4.57			
Facility size[‡‡]			27,794	30,763			

continued

Table 1. *Continued*

	Level 1		*Level 2*		*Level 3*		
Variable	*Mean*	*SD*	*Mean*	*SD*	*Mean/SD*	*Mean/SD*	*Mean/SD*
Level 3 Variables[§§]							
Falls rate					1.64/8.61	0.04/0.02	0.03/0.02
Falls with injury					0.02/0.03	0.01/0.01	0.01/0.01
Medication error					0.25/0.33	0.07/0.04	0.06/0.04
Medication error with injury					0.02/0.06	0.01/0.01	0.01/0.01

Notes. Level 1: $N = 2{,}596$ Nurses across 110 hospitals. Level 2: $N = 206$ outpatient facilities from 35 health care systems; includes only outpatient nurses and outpatient patient data. Number of nurse respondents per hospital: $M = 16.9$, SD = 43.45, Range: 1–352. Level 3: Combined reported below the diagonal, outpatient-only/inpatient-only reported above the diagonal. Number of nurse respondents per health care system: Combined: $M = 98.22$, SD = 93.91, Range: 1–417; Inpatient only: $M = 88.00$, SD = 66.54, Range = 27–236; Outpatient only: $M = 68.74$, SD = 43.40, Range: 15–181.

[†]Measured using a 4-point Likert-type response scale. For Levels 2 and 3, means within each facility or hospital system were first calculated.

[‡]For Levels 2 and 3, we calculated a percentage of nurses scoring "1" (Range for Section 1: Desire: 4.76 to 100; Intention: 2.17 to 100; Range for Section 2: Desire: 4.76 to 100; Intention: 2.17 to 100).

[§]0 = LPN, 1 = RN.

[¶]0 = Civilian, 1 = Military enlisted.

[‖]0 = Nonmanager, 1 = Manager.

[††]Level 2 patient attitude variables reflect Percentage of patients reporting in top 2 (most favorable) response categories.

[‡‡]Total eligible patient population (Range: 303–146,052).

[§§]Level 3 variables are scaled to incidents per 1,000 inpatient days/outpatient encounters.

Level-1 Hypotheses: Predicting Satisfaction and Turnover Cognitions

Tables 2 and 3 present Level-1 results. H1a-H1e (Table 2) were fully supported. H2a-H2e (Table 3; desire to quit) were also fully supported. Results for intention to quit (Table 3; H3a–H3e) were less consistent. H3b, H3c, and H3d were supported, with staffing adequacy, teamwork between nurses and physicians, and reliance on nursing care practice, respectively, all negatively associated with intentions to quit. The models for leadership support and advancement opportunities would not converge, perhaps because of lower base rates.

Level-2 Hypotheses: Organizational-Level Patient Satisfaction

We conducted the Level-2 hypothesis tests (H4–H9), with nurse satisfaction and the two dissatisfaction-based turnover cognitions simultaneously predicting each type of patient satisfaction, controlling for facility size. All outcomes were measured by outpatient surveys only, so we only included aggregated data from outpatient nurses at each hospital ($n = 40$), but we accounted for facility membership in health care systems (Level 2 grouped within Level 3). As shown in Table 4 (Section 1), neither desire nor intention was significant at $p < .05$ (H4b-9b and H4b-9b). Self-reported nurse satisfaction was only significant in predicting patient willingness to recommend (H4a), ability to see provider when needed (H6a), knowledge to make healthy choices (H7a), and satisfaction with health care overall (H8a); H5a and H9a were not supported.

Level-3 Hypotheses: Adverse Events

Next, we tested H10-H13. We had complete data for 17 hospital systems offering both inpatient and outpatient services (which we refer to as "combined"), 32 systems offering outpatient-only services, and 13 systems for inpatient-only services (see Table 5). For both combined and outpatient-only models, self-reported satisfaction was a significant predictor of falls with injury and medication errors with injury, fully supporting H11a and H13a. In the outpatient-only models, dissatisfaction-based desire to quit was a significant predictor of the number of falls, and in both the outpatient-only and inpatient-only models, intention to quit was a significant predictor of medication errors, but all three relationships were negative, contrary to expectations.

Table 2: Multilevel Modeling Results for Self-Reported Satisfaction

Predictor	*Estimate*	*SE*	*DF*	*t-Value*
Model 1: Pseudo R^2 = .39				
Intercept	3.21	.03	109	118.45*
Nurse type	−0.04	.03	2,482	−1.29
Military status	−0.17	.03	2,482	−6.05*
Management status	−0.11	.05	2,482	−2.22**
Perceived leadership support	0.71	.02	2,482	39.70*
Model 2: Pseudo R^2 = .22				
Intercept	3.18	.03	109	100.04*
Nurse type	−0.06	.03	2,482	−1.66
Military status	−0.09	.03	2,482	−2.87*
Management status	0.12	0.06	2,482	2.16**
Staffing adequacy	0.48	0.02	2,482	25.80*
Model 3: Pseudo R^2 = .18				
Intercept	3.14	.03	109	99.86*
Nurse type	−0.01	.04	2,482	−0.15
Military status	−0.11	.03	2,482	−3.23*
Management status	0.10	.06	2,482	1.74***
Nurse–physician teamwork	0.53	0.02	2,482	23.13*
Model 4: Pseudo R^2 = .14				
Intercept	3.24	.03	109	99.41*
Nurse type	−0.09	.04	2,482	−2.61**
Military status	−0.16	.03	2,482	−4.86*
Management status	0.12	.06	2,482	1.99***
Nursing care practice	0.42	.02	2,482	19.17*
Model 5: Pseudo R^2 = .32				
Intercept	3.27	0.03	109	116.35**
Nurse type	−0.07	.03	2,482	−2.11**
Military status	−0.25	.03	2,482	−8.19*
Management status	−0.04	.05	2,482	−0.73
Advancement opportunities	0.70	.02	2,482	34.32*

Notes. N = 2,596 nurses across 110 hospitals.
*p < .01; **p < .05; ***p < .10.

DISCUSSION

We proposed a multisource model of antecedents and individual-level, facility-level, and health care system-level outcomes of nursing satisfaction and dissatisfaction-based turnover cognitions. The most consistent support emerged for nurse self-reported satisfaction in predicting patient attitudes and adverse events. The results also reveal consistent linkages between five workplace factors and nurse attitudes at the individual nurse level.

Table 3: Multilevel Modeling Results for Dissatisfaction-Based Desire and Intention to Quit

			Wald 95% Confidence Limits		
Predictor	*Estimate*	*SE*	*Lower*	*Upper*	*Wald χ^2*
DV: Dissatisfaction-based desire to quit					
Model 1: AIC = 2,454.06					
Intercept	−1.64	0.06	−1.75	−1.53	819.79
Nurse type	0.05	0.06	−0.07	0.16	0.64
Military status	−0.01	0.04	−0.10	0.08	0.08**
Management status	0.27	0.11	0.06	0.48	6.19*
Perceived leadership support	−0.80	0.03	−0.85	−0.75	868.84
Model 2: AIC = 2,756.27					
Intercept	−1.51	0.06	−1.64	−1.38	539.24*
Nurse type	0.11	0.07	−0.03	0.25	2.22
Military status	−0.10	0.07	−0.23	0.04	2.01
Management status	−0.04	0.13	−0.29	0.21	0.10
Staffing adequacy	−0.53	0.04	−0.60	−0.46	223.65*
Model 3: AIC = 2,782.19					
Intercept	−1.43	0.06	−1.55	−1.31	518.37*
Nurse type	0.04	0.07	−0.10	0.18	0.38
Military status	−0.10	0.07	−0.23	0.03	2.46
Management status	−0.07	0.12	−0.31	0.17	0.36
Nurse–physician teamwork	−0.52	0.03	−0.58	−0.46	290.92*
Model 4: AIC = 2,799.52					
Intercept	−1.56	0.07	−1.68	−1.43	556.54*
Nurse type	0.18	0.07	0.04	0.32	6.00**
Military status	−0.03	0.07	−0.17	0.10	0.21
Management status	−0.05	0.13	−0.31	0.20	0.17
Nursing care practice	−0.51	0.04	−0.59	−0.44	200.35*
Model 5: AIC = 2,578.21					
Intercept	−1.71	0.06	−1.83	−1.58	709.91*
Nurse type	0.14	0.07	0.01	0.27	4.71**
Military status	0.10	0.06	−0.02	0.21	2.75
Management status	0.17	0.11	−0.06	0.39	2.12
Advancement opportunities	−0.84	0.04	−0.91	−0.77	542.12*
Intercept	−0.61	0	−0.61	−0.61	–
Nurse type	0.07	0	0.07	0.07	–
Military status	0.004	0	0.004	0.004	–
Management status	−0.05	0	−0.05	−0.05	–
Perceived leadership support	−0.32	0	−0.32	−0.32	–
Intercept	−2.62	0.13	−2.87	−2.38	436.34*
Nurse type	0.32	0.14	0.04	0.59	5.06**
Military status	−0.17	0.12	−0.41	0.08	1.78
Management status	−0.58	0.30	−1.167	0.001	3.83***

continued

Table 3. *Continued*

Predictor	*Estimate*	*SE*	*Wald 95% Confidence Limits*		*Wald* χ^2
			Lower	*Upper*	
Staffing adequacy	−0.68	0.07	−0.81	−0.54	97.66*
Intercept	−2.53	0.12	−2.77	−2.29	422.05*
Nurse type	0.23	0.14	−0.04	0.50	2.73
Military status	−0.14	0.12	−0.38	0.10	1.26
Management status	−0.61	0.30	−1.19	−0.02	4.16**
Nurse–physician teamwork	−0.67	0.06	−0.79	−0.54	105.39*
Intercept	−2.75	0.13	−3.00	−2.50	455.85*
Nurse type	0.44	0.14	0.16	0.71	9.88*
Military status	−0.05	0.12	−0.29	0.20	0.13
Management status	−0.60	0.30	−1.19	−0.02	4.11**
Nursing care practice	−0.74	0.07	−0.87	−0.61	116.48**
Intercept	−0.57	0	−0.57	−0.57	–
Nurse type	0.09	0	0.09	0.09	–
Military status	0.04	0	0.04	0.04	–
Management status	−0.09	0	−0.09	−0.09	–
Advancement opportunities	−0.31	0	−0.31	−0.31	–

Notes. $N = 2{,}596$ nurses across 110 hospitals (661 scored "1" on desire to quit and 253 scored "1" on intention to quit for a dissatisfaction-based reason).
*$p < .01$; **$p < .05$; ***$p < .10$.

THEORETICAL IMPLICATIONS

We provide a nuanced look at dissatisfaction, honing in on two types of turnover cognitions that may more precisely predict preventable turnover behavior (compared to general satisfaction attitudes or general turnover cognitions). Beneficial workplace factors were negatively associated with dissatisfaction-based turnover cognitions, as expected, but unexpectedly, these turnover cognitions were associated with *fewer* adverse events. More research is needed on this, but perhaps nurses with an eye toward turnover place more emphasis on safety or adhering to protocol, or adopt a "back-to-basics" mentality in following rules, independent of how patients are treated interpersonally. In theorizing about the proposed relationships at three distinct levels of analysis, we also provide insight on why the linkages may exist—when innate needs for competence, relatedness, and autonomy are met, per SDT, nurses and their organizations may be better equipped and energized to manage patients (Deci, Connell, and Ryan 1989).

Table 4: Multilevel Modeling Results for Outpatient Facility Patient Satisfaction

Predictor	*Estimate (SE)*
DV: Willingness to Recommend Hospital to Friends (Pseudo R^2 = .93)	
Intercept	41.42* (10.71)
Facility size	0.00001 (0.00002)
Self-reported satisfaction	9.13** (3.11)
Dissatisfaction-based desire to quit	0.04 (0.05)
Dissatisfaction-based intention to quit	0.02 (0.12)
DV: Satisfaction with Nurses (Pseudo R^2 = .87)	
Intercept	94.72* (3.11)
Facility size	−1.5E−06 (6.26E−6)
Self-reported satisfaction	0.45 (0.90)
Dissatisfaction-based desire to quit	0.01 (0.01)
Dissatisfaction-based intention to quit	−0.0004 (0.04)
DV: Ability to See Provider When Needed (Pseudo R^2 = .69)	
Intercept	46.94* (11.11)
Facility size	−0.00003 (0.00002)
Self-reported satisfaction	11.45* (3.23)
Dissatisfaction-based desire to quit	0.02 (0.05)
Dissatisfaction-based intention to quit	0.05 (0.13)
DV: Knowledge to Make Healthy Choices (Pseudo R^2 = .80)	
Intercept	83.35* (3.81)
Facility size	−6.98E−06 (7.53E−6)
Self-reported satisfaction	3.25** (1.11)
Dissatisfaction-based desire to quit	−0.003 (0.02)
Dissatisfaction-based intention to quit	0.03 (0.04)
DV: Satisfaction with Health Care Overall (Pseudo R^2 = .88)	
Intercept	69.95* (4.80)
Facility size	−2.07E−6 (9.72E-06)
Self-reported satisfaction	7.07* (1.39)
Dissatisfaction-based desire to quit	0.04*** (0.02)
Dissatisfaction-based intention to quit	−0.04 (0.05)
DV: Satisfaction with Current Visit (Pseudo R^2 = .51)	
Intercept	96.46* (7.45)
Facility size	1.88E−06 (0.00001)
Self-reported satisfaction	−0.75 (2.20)
Dissatisfaction-based desire to quit	0.001 (0.04)
Dissatisfaction-based intention to quit	−0.04 (0.09)

Notes. N = 40 outpatient facilities across 27 health care systems. Patient responses reflect percent favorable or highly favorable out of all patients responding to survey.
*p < .01; **p < .05; ***p < .10.

Table 5: Regression Results Predicting Health Care System-Level Adverse Events

Predictor	*Estimate (SE) Section 1: N = 17 Systems (Combined Inpatient/ Outpatient)*	*Estimate (SE) Section 2: N = 13 Systems (Inpatient Only)*	*Estimate (SE) Section 3: N = 32 Systems (Outpatient Only)*
DV: Falls			
	(Adj. R^2 = .09)	(Adj. R^2 = .22)	(Adj. R^2 = .14)
Intercept	0.55 (1.73)	0.26 (0.14)	0.19** (0.08)
Self-reported satisfaction	−0.19 (0.52)	−0.08*** (0.04)	−0.04*** (0.02)
Dissatisfaction-based desire to quit	−0.003 (0.01)	0.0003 (0.001)	−0.001** (0.0004)
Dissatisfaction-based intention to quit	0.03 (0.03)	0.0004 (0.002)	0.001 (0.66)
DV: Falls with Injury			
	(Adj. R^2 = .26)	(Adj. R^2 = .13)	(Adj. R^2 = .38)
Intercept	0.76** (0.34)	0.06 (0.10)	0.17** (0.05)
Self-reported satisfaction	−0.24** (0.10)	−0.02 (0.03)	−0.05* (0.01)
Dissatisfaction-based desire to quit	0.03 (0.002)	0.0002 (0.001)	−0.0003 (0.0003)
Dissatisfaction-based intention to quit	−0.01 (0.01)	0.001 (0.002)	0.001 (0.001)
DV: Medication Errors			
	(Adj. R^2 = .13)	(Adj. R^2 = .25)	(Adj. R^2 = .14)
Intercept	3.35 (4.14)	0.10 (0.35)	0.17 (0.21)
Self-reported satisfaction	−1.06 (1.24)	−0.01 (0.10)	−0.02 (0.06)
Dissatisfaction-based desire to quit	−0.01 (0.03)	0.01*** (0.003)	0.001 (0.001)
Dissatisfaction-based intention to quit	0.06 (0.07)	−0.01** (0.01)	−0.01** (0.003)
DV: Medication Errors with Injury			
	(Adj. R^2 = .21)	(Adj. R^2 = .11)	(Adj. R^2 = .37)
Intercept	1.678** (0.75)	0.10 (0.12)	0.27* (0.06)
Self-reported satisfaction	−0.52** (0.22)	−0.03 (0.04)	−0.08* (0.02)
Dissatisfaction-based desire to quit	0.01 (0.01)	0.001 (0.001)	−0.0004 (0.0003)
Dissatisfaction-based intention to quit	−0.02 (0.01)	−0.001 (0.002)	−0.0003 (0.001)

Notes. *$p < .01$; **$p < .05$; ***$p < .1$.

Practical Implications

Dissatisfied nurses are likely to leave an organization, which is costly (Coomber and Barriball 2007). While not all turnovers are preventable, there is an opportunity for managers to reduce dissatisfaction by addressing the factors we studied. Leaders can impact those areas through existing tools and techniques, such as the Situation, Background, Assessment, and Recommendation and TeamSTEPPS techniques to improve collaboration (De Meester et al. 2013; Galletta et al. 2013). Lean Daily Management is another way leaders can encourage shared governance with two-way information flow between bedside nurses and leaders (Kramer et al. 2009). Our results suggest that these measures should be a priority, as nurse satisfaction was linked to measurable outcomes at the facility and system levels, including patient attitudes and adverse events.

Strengths, Limitations, and Future Research

A major strength of this study was our dataset —we were able to examine individual attitudes, patient satisfaction, and adverse events in an entire population of Army health care facilities, which provided insight into antecedents and outcomes of nursing satisfaction and turnover cognitions in an important context (9.6 million beneficiaries served). Civilian and military organizations are similar in many challenges they face, improving generalizability. Even so, our analyses may suffer in the limited number of predictors we could consider in one model, especially at the facility and system levels (we could not include all predictors in a single model). We included facility size at Level 2, but we did not include any controls at Level 3, because of limited access to relevant variables and concerns about power. Additionally, further research is warranted to enhance our understanding of intermediate mechanisms in the link between workplace factors and nurse/patient outcomes. Despite the limitations, the relationships uncovered are potentially valuable, as they reveal associations at multiple levels of analysis, all with important managerial implications. Nursing satisfaction is indeed a critical linchpin in the pursuit of happier and healthier workplaces that foster safety and quality patient care.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Appendix SA1: Author Matrix.

Table A1: Full Correlations and Descriptive Statistics of Level-1 Variables.

Table A2: Full Correlations and Descriptive Statistics of Level-2 and Level-3 Variables.