Exploring the Direct and Indirect Costs of Nurse Burnout for a Health Care Organization

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Dedication

This work is dedicated to all nurses fighting for their patient's lives and their own during the

COVID-19 pandemic and well before then. I continue to learn from you and am inspired to make

the work we do better.

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CHAPTER 1: PROJECT SUMMARY/ABSTRACT

Background: Burnout, defined as emotional exhaustion, depersonalization, and a sense of low personal accomplishment, impacts 1 in 3 registered nurses (RNs) in addition to patients and health care organizations across the United States. Despite a plethora of research on the drivers of RN burnout, there is a gap in current health services research relevant to the direct costs (i.e., costs directly linked to a healthcare resource or service) and indirect costs (i.e. social and cultural consequences) of RN burnout. The purpose of this dissertation was to comprehensively describe both the direct and indirect costs of RN burnout for a health care organization. Aim 1 of the study sought to evaluate the direct costs of RN burnout-attributed turnover. Aim 2 explored the cultural, indirect costs of RN burnout in an Emergency Department (ED).

Methods*: Using a multi-modal approach, direct RN burnout costs were assessed using Markov modeling approaches (i.e., decision analysis), and indirect costs were evaluated through an 18-month ethnography. Data collection and analysis were informed by the Social Ecological Model (SEM). A Markov model was used to evaluate direct costs of RN burnout-attributed turnover (Aim 1) in a hospital with baseline, status quo burnout prevalence rates, compared to one with a burnout intervention program. Ethnographic fieldwork (Aim 2) was conducted over 18 months through participant observations and in-depth interviews semi-structured interviews in a level one, academic medical center ED. Inductive and deductive coding strategies were used to analyze the fieldnotes and interviews to identify emerging categories and themes

Results*: Our results show that RN burnout imparts significant economic burdens to a health care organization. Aim 1 of the study found that, in modeling burnout up to 10 years, RN burnout costs \$11,592 per RN per year employed in a hospital. RNs spent more time in burnout in the status quo scenario (i.e., hospital with higher RN burnout) than the hospital with a burnout

reduction program (1.5 years vs. 1.1 years of employment), as well as less time employed at the hospital (2.9 years vs 3.5 years of employment). Aim 2 findings revealed multi-level costs to RNs, patients, team members, and the health care system as demonstrated through an explanatory model, the Muir Pathway of Burnout. Individual impacts of burnout included RN withdrawal and a loss of professional identity; interpersonal impacts included loss of team cohesion and inadequate RN training; on a systems-level RN burnout was perceived as a cultural norm which detracted from necessary interventions and in turn compromised the ostensibly valued culture of patient safety. Aim 2 findings also revealed how a significant change, exhibited through a physical move in the ED, exacerbated existing RN burnout and turnover intent.

Conclusion: RN burnout imparts significant direct and indirect costs to a health care organization, supporting the need for hospital investment in burnout interventions. The Pathway of Burnout can help health care leaders identify where RNs are within the Pathway of Burnout and then inform when, and how, to implement relevant interventions. The comprehensive findings from this dissertation can inform future large-scale, national studies evaluating RN burnout costs to support RN burnout policy development and implementation.

Keywords: *Burnout, turnover, health economics, decision analysis, ethnography*

PROJECT NARRATIVE

This study evaluated the direct and indirect costs of RN burnout for a health care organization.

By pairing direct economic costs with rich qualitative data on less visible, indirect costs of

burnout, this study provides valuable information for health care organization investment in RN

burnout interventions.

SPECIFIC AIMS

Burnout is a public health crisis with multi-level impacts to registered nurses (RNs), patients, and health care organizations.[1] An occupational phenomenon characterized by emotional exhaustion, depersonalization, and a sense of low personal accomplishment,[2] burnout is prevalent among 35 to 45% of RNs in the United States (U.S.).[1] Burnout is concerning for RNs because it contributes to a yearly RN turnover rate of 17%[3] across U.S. hospitals, exacerbating RN shortages[4] and inadequate RN staffing.[5] On a patient level, burnout is linked to healthcare-associated infections such as catheter-associated urinary tract infections (CAUTIs)[6] and other suboptimal outcomes.[7-13] Within health care organizations, burnout drives low patient satisfaction[13] and poor ratings of hospital safety culture.[12] Although the burdens of RN burnout are well-documented, there is a dearth of evidence on the economic impact of RN burnout to health care organizations, specifically around the 1) direct costs (i.e. costs directly linked to a healthcare resource or service)[14] and 2) the indirect costs (i.e. invisible, cultural consequences)[14] of burnout that influence patient care delivery. Comprehensively evaluating both the direct *and* indirect costs of RN burnout is a critical step to advance policies that address RN burnout and in turn improve healthcare for AHRQ priority populations, such as women, children, racial/ethnic minorities, the elderly, individuals with disabilities, and rural/inner-city populations.[15]

Research to date identifies that RN turnover[16] and poor patient care[6,17] drive direct costs for health care organizations. However, data are sparse on the RN burnout-specific direct costs of RN turnover and suboptimal patient quality care for health care organizations. Furthermore, although burnout has been shown to transfer from the individual RN level throughout entire health care units,[18,19] very little is known about the indirect costs of burnout impacting RN productivity, workflow, and other cultural aspects of patient care delivery. Such indirect costs are

particularly problematic for complex care settings like emergency departments (EDs) where RNs

experience the highest burnout prevalence rates (44%),[20] operate under heightened constraints, and

deliver team-based care to patients at the first level of entry to hospitals.[20] The existence of the

aforementioned gaps is a problem because health care organizations may be underestimating the

economic impact of burnout.

 More comprehensive evidence on the costs of RN burnout is needed for health care

organizations to adequately assess and invest in systems-level policies that reduce RN

burnout.[1] The proposed dissertation addresses this gap by evaluating RN direct burnout costs

associated with RN (turnover) and patient (CAUTI) outcomes, and by elucidating highly

contextualized evidence of RN burnout indirect costs within a complex health care unit. This study

will use both quantitative decision analytic models (Aim 1) and qualitative ethnography (Aim 2)

to develop evidence that can advance clinician burnout policies relevant to: expanding the RN

workforce, supporting optimal RN staffing, and optimizing RN workflows.[1] <u>This study is feasible</u>

<u>as it builds on 6 months of completed ethnographic data collection (Aim 2) by the PI.</u> The aims of

this multi-modal study are:

Aim 1. Develop economic models to evaluate the cost of RN burnout for a health care

organization.

 <u>***Aim 1a)***</u> **Estimate the cost of RN burnout-attributed turnover:** A Markov model[22] will be

 designed using RN burnout and turnover probabilities to estimate the cost of RN-burnout

 attributed turnover over 10 years. The model will simulate the transition of RNs through states

 of burnout and turnover within a hospital.

 <u>***Aim 1b)***</u> **Estimate the cost of RN burnout-attributed suboptimal patient care:** A decision

 tree[23] will be designed using RN burnout and CAUTI probabilities to estimate the cost burden

of burnout on a suboptimal patient care outcome. The model will simulate the transition of an RN cohort through "burnout" or "no burnout" states, leading to, "care resulting in CAUTI" or "care resulting in no CAUTI" endpoints and costs.

Aim 2. Utilize an ethnographic approach to comprehensively examine the social and cultural indirect costs of RN burnout within an ED. This aim consists of a 12-month ethnography of an ED, where fieldnotes, in-depth interviews, participant-observation, and artifact gathering will develop a contextualized, cultural understanding of RN burnout indirect costs.[24,25] Study Aims will be integrated using a multi-method approach informed by principles of mixed methods[26,27] by 1) validating findings between Aims; 2) explaining Aim 1 direct costs through Aim 2 themes; 3) adding to Aim 1 costs by elucidating cultural, indirect costs in Aim 2; and 4) identifying indirect costs in Aim 2 necessary for inclusion in future economic evaluations of RN burnout.

This proposal addresses national priority areas as it: 1) integrates both quantitative and qualitative data to develop a comprehensive understanding of RN burnout costs, both direct and indirect; 2) addresses the significant issue of compromised patient quality care and health care affordability linked to RN burnout; and 3) and is responsive to the National Academies of Sciences, Engineering, and Medicine's (NASEM) Clinician Action Collaborative focus to develop, "Economic models that estimate the costs of clinician burnout across disciplines, including medicine, nursing…".[1] The proposed outcome of this study is a rigorous evaluation of RN burnout direct costs paired with rich ethnographic perspectives. As hospitals face rising patient demands, this evidence can support systems-level policies that promote safe RN workloads, increase RN retention, reduce RN burnout, and improve overall healthcare delivery.

RESEARCH STRATEGY

Significance

Recently added to the World Health Organization's International Classification of Diseases,[28] burnout is an occupational phenomenon that impacts 1 in 3 registered nurses (RNs),[13] millions of patients receiving health care services, and health care organizations as a whole.[29] Although RNs represent the largest healthcare professional group in the U.S. amounting to 3 million clinicians,[30] a yearly national RN turnover rate of 17%,[3] driven in part by burnout,[31] threatens RN supply and the safe provision of patient care.[5] The phenomenon of RN burnout is cyclical as it is both a driver of RN turnover, but is also an outcome among RNs operating under suboptimal RN staffing attributed to high RN turnover and increased patient workloads. Within the patient care domain, RN burnout is linked to suboptimal outcomes such as increased healthcare-associated infections (HAIs),[6] increased standardized mortality ratios,[32] and low ratings of quality care among RNs.[10,11] A 10% increase in RN burnout across a hospital is associated with an increase in approximately 1 catheter-associated urinary tract infection (CAUTI) per 1,000 patients.[6] These findings are concerning given that CAUTIs are a highly preventable HAI linked to nursing care, as RNs place and maintain patient Foley catheters.[6] At a health care organization level, 50% of hospitals with high rates of RN burnout are rated as poor work environments with low patient satisfaction.[13] Although there is a plethora of research on the multi-level outcomes of RN burnout, the economic consequences of burnout for health care organizations are poorly understood.[1] This proposal fills this gap by evaluating the direct (i.e. costs directly linked to a healthcare resource or service) [14]and indirect costs (i.e. invisible, cultural consequences)[14] of RN burnout. This evidence is needed to advance systems-level policies that address RN burnout, improve patient care, and secure an adequate RN workforce.[1]

Burnout is associated with direct and indirect costs to health care organizations. The average hospital cost of RN turnover is $44,000 per RN, [34] **while one HAI can cost upwards of $30,000 in hospital costs.**[35] <u>Less is known, however, about the direct costs of RN burnout-attributed turnover and suboptimal patient quality outcomes</u>. Furthermore, health care organizations are impacted by the indirect effects of burnout given evidence linking individual RN burnout complaints to collective health care unit burnout reports.[18,19] However, much remains unknown to date on the cultural aspects of RN burnout indirect costs influencing RN productivity, workflow, and patient care delivery. The cultural consequences of such indirect costs are of particular concern within complex health care settings such as emergency departments (EDs), where RN burnout prevalence is the highest,[20] team-based care is a significant aspect of the work culture,[36] and where patients first enter hospitals. The failure to comprehensively capture the direct and indirect costs of RN burnout may significantly underestimate RN burnout costs for health care organizations.

Targeted health care system changes could reduce RN burnout and its impact on patient care.[1] **However, understanding the comprehensive costs of RN burnout is needed to optimize strategies.** Evaluating the comprehensive costs of RN burnout is necessary to support health care organization investments in policies and interventions that address RN burnout specific to: adequate RN staffing, expanding the RN workforce, and developing optimal unit workflows for patients and clinicians.[1,4] There is a scientific gap in RN burnout research between identifying outcomes of RN burnout and rigorously quantifying and evaluating the RN-burnout *specific* direct and indirect costs to health care organizations. Specific evidence gaps include **1)** RN and patient-level direct costs of RN burnout to health care organizations and **2)** indirect costs of RN burnout impacting the culture of health care delivery within complex care settings. Furthermore, despite

Han and colleagues'[37] research estimating physician burnout costs in the U.S., current nursing research has not kept pace in developing such evidence on RN burnout costs. Given that RNs represent the largest healthcare professional group in the U.S.,[30] developing evidence on RN burnout costs is a critical step necessary to address the public health crisis.[38]

Given the aforementioned knowledge gaps, and in response to AHRQ's and the National Academies of Sciences, Engineering, and Medicine's (NASEM) missions, [1,39] the proposed study will leverage data from existing health services research to **1) develop economic models evaluating RN burnout-attributed turnover and a suboptimal patient quality outcome (CAUTI) direct costs and 2) richly describe the indirect costs of RN burnout within an ED setting using a qualitative, ethnographic approach**. This study will be guided by the Social-Ecological model (SEM)[40] conceptual framework to elucidate a comprehensive perspective of RN burnout costs. The evidence gleaned from this study include an evaluation of direct RN- and patient-level costs, as well as highly contextualized, rich descriptions of the indirect costs of RN burnout that manifest within an ED and influence RN productivity, workflow, and patient care delivery. The findings from this research will be used to inform health care organizations and broader healthcare policy around the economic consequences (both direct and indirect) of burnout. This evidence is critical, 1) to understand RN burnout costs in comparison to other clinician groups, 2) to generate evidence for health care organization decision-making regarding investments in RN burnout policies, 3) to contribute to a larger evidence base where large-scale economic models incorporate multi-clinician burnout costs across U.S. health care organizations[1], and **4) to fulfill AHRQ's mission to generate evidence making healthcare safer, high-quality, more equitable, affordable, and accessible.[39]**

<u>Innovation</u>

In addition to addressing a gap identified by national healthcare agencies such as NASEM to develop, "Economic models that estimate the costs of clinician burnout across disciplines…"[1] **this study is innovative due to its comprehensive approach, justified as follows. First,** this study evaluates direct RN burnout costs (Aim 1) using decision analysis modeling approaches that simulate real-life RN burnout turnover and patient care delivery scenarios and associated costs. Compared to current health services research to date[6,14,16], this approach specifically depicts RN burnout as a series of dynamic events that results in costly outcomes (i.e. turnover or suboptimal patient quality care) to health care organizations. **Second,** this study fills an important health economics methodological gap by qualitatively describing the indirect costs of RN burnout. Few studies to date integrate qualitative perspectives with economic evaluations, despite recommendations set forth by the Second Panel on Cost Effectiveness in Health and Medicine[41] to include multi-stakeholder[42,43] perspectives with health economic evaluations. **Third,** given that RN burnout is a complex phenomenon,[44] this study uniquely uses a multi-method data collection and analytic approach to evaluate the economic burden of burnout through decision analytic models *and* through thick, ethnographic descriptions of burnout indirect costs. The multi-modal approach of this study facilitates the integration of direct RN burnout costs combined with culturally-embedded descriptions of RN burnout impacts that extend beyond the individual RN level. By using economic models combined with ethnography, this study produces a valuable deliverable to health care organizations in the form of 1) an interpretable, transparent evaluation of direct RN burnout costs and 2) contextualized examples of RN burnout indirect costs that cannot be directly evaluated in a quantitative model alone.

Preliminary Work

The PI is an ED RN with experience conducting research on RN burnout. Prior to beginning this dissertation work, the PI conducted a pilot study in the ED setting investigating the impact of a Mindfulness-based intervention on ED RN and patient care technician burnout.[45] From this work published in the *Journal of Holistic Nursing*,[45] the PI garnered essential knowledge around the use of the validated Maslach Burnout Inventory (MBI)[44] for quantitative data collection and analysis, as well as the use of qualitative, descriptive methods to understand clinician burnout drivers using a multi-modal approach. Quantitative study findings from this study indicated intervention-associated reductions in RN burnout, while qualitative perspectives revealed that low RN staffing and increased workflow pressures drove RN burnout and turnover. The findings highlighted the critical need to develop research that economically and culturally assesses RN burnout for dissemination to health system policymakers.[1] To develop a foundation in assessing indirect costs in the proposed study, the PI and Dr. Keim-Malpass published a methodological paper on spillover effects in health economics research in the *Journal of Comparative Effectiveness Research*.[46] Finally, this proposal (specifically Aim 2) is informed by 6 months of ethnographic data collection already initiated by the PI, inclusive of 25 completed formal interviews.

Approach

Through a multi-modal approach informed by principles of mixed methods[26,27]the goal of this study is to quantify the direct costs of RN burnout using economic models (Aim 1), and to qualitatively describe RN burnout indirect
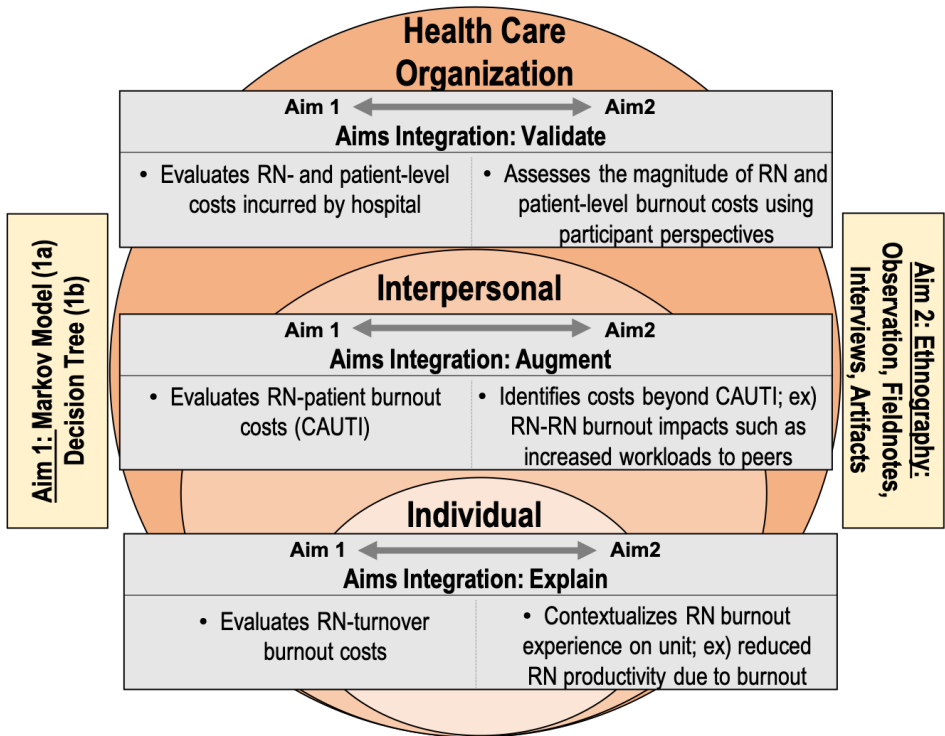

Figure 1: Study Approach
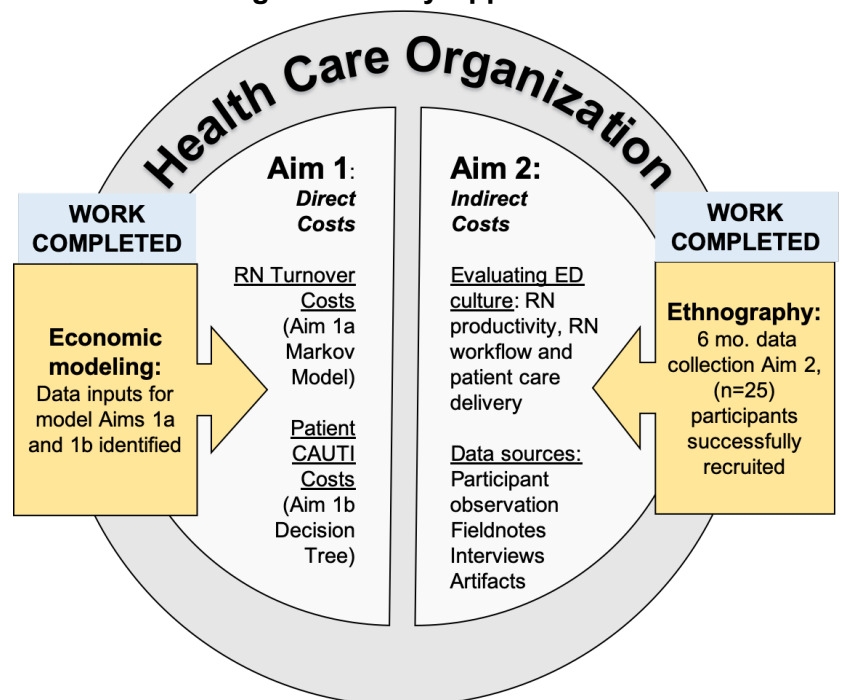
costs within a health care unit using ethnography (Aim 2). The first aim of the study is two-tiered;

the cost of RN burnout-attributed turnover is estimated using a Markov model (Aim 1a), and the

cost of RN burnout-attributed suboptimal patient care is estimated using a decision tree model

(Aim 1b). The suboptimal patient quality indicator used in Model 1b is CAUTI given that it is a highly cited nursing-sensitive indicator associated with approximately 6,000 to 13,000 patient deaths annually.[47-49] Aim 2 is an ethnography that describes the social and cultural aspects of burnout indirect costs within the cultural context of an ED. Aim 2 data sources include immersive

Figure 2: SEM and Aims Integration

fieldnotes, interviews with RN and non-RN subjects, and artifacts.[24,25] Figure 1 depicts an

overview of study approach. Aims will be integrated (see Figure 2) by: 1) validating findings

between both Aims; 2) explaining in Aim 2 costs evaluated in Aim 1; 3) augmenting Aim 1 costs

by describing indirect costs gleaned in Aim 2; and 4) identifying costs in Aim 2 for consideration

in future models.[26,27]

Conceptual Framework: The SEM[38,50] is the conceptual framework (Figure 2) guiding this study

as it reflects the inter-related impacts of RN burnout on an individual, interpersonal, and broader

organizational level. The SEM situates burnout as a phenomenon impacting individual RN

attitudes and behaviors, evidenced by turnover (Aim1a) and inter-personal outcomes such as poor

patient care (Aim1b). The health care organization level is highly impacted by direct costs. Aim 2

reveals the context of RN burnout at all three levels, with a specific focus on the social/cultural

indirect costs.

Aim 1. Develop economic models to evaluate the cost of RN burnout for a health care
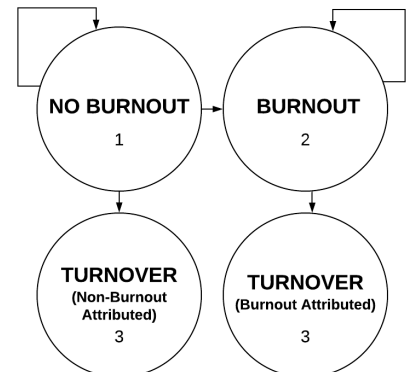
organization.

Overview of Aim 1:

The development and implementation of successful policy targeted at increasing RN retention, and

resulting improvements in patient care safety and quality necessitates a robust conceptualization

of direct RN burnout costs.[1] The aim of this economic evaluation is to determine the incremental

costs of RN burnout-attributed turnover (Aim 1a) and patient care resulting in a CAUTI (Aim 1b).

Cost models will be built to assess direct RN burnout costs and sensitivity analyses (univariate and

multivariate) will be performed to test model input uncertainty. [22]

Modeling Strategy: Markov and decision tree models[22,23] are two types of decision analysis

techniques that will be used in Aim 1 to estimate the direct costs of burnout-attributed turnover

and the delivery of suboptimal quality care in the form of the CAUTI. **Model Aim 1a uses a**

Markov model to reflect potential pathways and outcomes related to RN

burnout and turnover over a series of discrete time periods known as cycles

(see Figure 3).[23] This Markov model represents a hypothetical progression

of events an RN cohort experiences working in a health care organization.

The model has three arms representing three primary RN "states": 1)

experience no burnout, 2) experience burnout, and 3) turnover (either non-

burnout or burnout-attributed). The entire RN cohort begins in state 1 (no burnout) and based on

Figure 3: Model Aim 1a Structure

probabilities from the nursing literature, progresses to the following states: leave the organization (turnover) not due to burnout, maintain no burnout, develop burnout, or leave the organization (due to turnover). The model cycles the RN cohort through states over the identified time horizon of 10 years, based on probabilities.[23] **Model Aim 1b uses a decision tree** with primary states of 1) no RN burnout and 2) RN burnout; subsequent arms are: care resulting in CAUTI, or care resulting in no CAUTI. Cycles will not be integrated into Model 1b's structure given that the transition events are non-recurring and have a relatively short, fixed time horizon.[23] The main outcomes in the model Aims 1a and 1b are the incremental costs of RN turnover and CAUTI due to burnout, calculated by comparing the costs for the "no burnout" and "burnout" states.[22,23] The calculation of expected costs for the model consists of the summation of the costs of RN turnover and CAUTI-related outcomes weighted by the probability of said consequences.[22,23]

Model Characteristics: In Models 1a and 1b, the RNs have at least one year of experience at baseline and work across any hospital setting in the U.S. Both models are conducted from the hospital perspective, meaning that costs are considered from the viewpoint of the health care organization as payer.[22] Model 1a progresses a cohort of RNs through the states, known as transitions, over the course of 10 years, or 10 model cycles. The model time horizon of 10 years is used in accordance with U.S. nursing workforce reports.[30,51]

Model Inputs: The data sources for the model inputs (Table 1) were found through a formal systematic search of studies published in peer-reviewed journals, as well as white papers published by healthcare agencies. **Burnout prevalence** in this study reflects the rate of RNs experiencing high burnout scores on the MBI (≥ 27 on emotional exhaustion and ≥ 10 on depersonalization subscales), assessed among 8,638 U.S. RNs. [52] **Turnover prevalence** reflects the average bedside RN termination rate from a survey of 108,047 RNs across 164 U.S.

facilities.[3] **CAUTI incidence** is gleaned from a study using the National Hospital Discharges Survey[47].

Table 1: Model Inputs and Sources

Model Input	Base Estimate	Sensitivity Analysis Range	Source
Prevalence/Incidence Estimates			
Burnout prevalence, %	38.4	33.6 - 43.2	9, 52, 53
Turnover prevalence, %	17.2	12 - 22.7	3, 54
CAUTI incidence	0.05	0.04 – 0.10	47, 49
Probabilities			
Non-burnout-attributed turnover	0.17	0.14 - 0.28	3
Acquiring burnout over time 1-5 years 6-10 years	0.34 0.46	0.33 - 0.36 0.41 - 0.54	52,53, 55
Burnout-attributed turnover	0.43	0.13 - 0.53	31, 54
Burnout-attributed CAUTI delivery	0.02	0.01 - 0.05	6
Healthcare costs			
Turnover per RN, $	44,000	36,853 – 83,578	14,16, 34,56
Cost of CAUTI per patient, $	14,613	4,809 - 30,470	57

Model 1a Probabilities: The probability of RN turnover not due to burnout was derived from the national RN turnover rate[3]. The probability of developing burnout was obtained from Potter's study[55] of RN burnout risk over time, assessed using the Professional Quality of Life Measure (ProQoL) and years of RN experience among 150 oncology RNs. Although this measurement tool differs from the gold standard MBI, and is specific to oncology RNs, it is the only study to date that accounts for burnout prevalence increases over 10 years. The probability of turnover due to burnout was calculated using data from a study on 612 Canadian RN burnout and intention to leave, and the U.S RN turnover rate.[3,31] Though Spence Laschinger's study uses intention to leave as a proxy for turnover, and is Canadian-based, it is the only current study to date that has rigorously identified an association between burnout (using the MBI) and intention to leave in North America.[31]

Model 1b Probabilities: The probability of RN burnout-attributed CAUTI care provision was calculated using data from Cimiotti and colleagues'[6] study among 7,076 U.S. RNs and the CAUTI incidence among catheterized adults.[47] The MBI assessed RN burnout.

Cost Inputs: The costs in Models 1a and 1b reflect the incremental costs incurred by a health care organization adjusted for 2018 inflation. In Model 1a, direct burnout costs are the costs of turnover, specifically the cost of job termination, vacancy positions, advertising and recruiting, and hiring for one RN derived from the Robert Wood Johnson Foundation's Wisdom at Work RN study.[56] Costs in Model 1b represent the incremental cost of a hospital stay due to a CAUTI, or the average per-patient costs associated with CAUTIs, derived from the AHRQ HAI program.[57] Costs will be discounted at an annual rate of 3% per recommendations by the Public Health Service Panel on Cost Effectiveness in Health and Medicine.[41]

Sensitivity Analysis: In order to assess model robustness and uncertainty around parameter inputs, one-way sensitivity and multivariate Monte Carlo simulations will be conducted in both models.[22,23] The models will be adjusted to a range of values (see Table1) given the base case analysis use of conservative model estimates.

Aim 1 deliverables include a transparent cost metric integrating RN burnout, turnover, and suboptimal patient quality care consequences that can be easily translated to policymakers leveraging impactful and efficient distribution of RN resources within hospitals. This model will serve as a beneficial foundation for future large-scale decision analytic modeling of RN burnout or (total clinician burnout) costs in the U.S.

Aim 2: Utilize an ethnographic approach to comprehensively examine the social and cultural indirect costs of RN burnout within an ED.

Overview of Aim 2: Building upon 6 months of data previously collected for the dissertation, the goal of this aim is to identify and describe the indirect costs of RN burnout that impact RN productivity, workflow, and patient care delivery within the cultural context of an ED. The PI will conduct 12 months of immersive, ethnographic fieldwork within an academic medical center (AMC) ED[24,25].

Setting and Sample: ED RN burnout rates are among the highest (44%)[20], thus justifying study site and sample selection for this study. The study setting is a large AMC ED in Central Virginia that provides trauma, pediatric, acute care, and women's health services and draws from a large rural catchment area. The ED consists of 120 RNs, 10 of which are traveler (contract) RNs. There are two samples in this study: RNs and non-RN employees (e.g., physicians (MDs), patient care technicians (PCTs), and hospital administrators). The secondary sample will provide an ancillary perspective on RN burnout. The inclusion criteria for each sample is as follows:

Primary sample—RNs: Permanent RN (non-traveler) and travel RNs (contract) aged 18 years or older working any full-time equivalent hours (wage, 0.5-1 FTE) and who spend 50% of time providing clinical care and have at least 6 months of clinical work experience. Travel RNs are ED contract RNs who are included to provide comparative perspectives as individuals who have worked in other EDs.[58]

Secondary sample—MDs, PCTs, and administrators: Individuals aged 18 years or older working in non-RN positions and who spend at least 50% of their time facilitating health care delivery in the ED.

Sampling: Approximately 70% of the participants recruited for semi-structured, in-depth interviews will be RNs (primary sample), while 30% will be non-bedside RNs (secondary sample). In alignment with ethnographic methods, adequate sampling will be achieved after

data saturation is achieved, around 50 in-depth interviews. RN participants will be recruited

based on varying lengths of ED clinical experience.

Recruitment: To date, the PI has successfully recruited 25 participants for in-depth interviews, and

established successful entry into the field. Participants will be recruited through announcements

made at day and night shift pre-shift huddles, as well as through staff emails. Additionally, the unit

RN assistant manager will serve as a gatekeeper[59] recommending participants for the study. After

an initial recruitment of participants (approximately 5-10), snowball sampling techniques[60] will be

used to recruit subsequent participants. As themes emerge during the iterative data analysis

process, theoretical sampling techniques[61] will guide recruitment.

Data Collection: Consistent with ethnography[24,25,60-62] this project will include three

complementary data sources: participant observations; interviews; and artifacts, which are detailed

below. Due to the current COVID-19 pandemic, in-person contact with participants (participant

observation, fieldwork) is prohibited but is anticipated to resume in late August 2020 at the PI's

institution. In-depth interviews are permitted within a virtual format.

Participant observation is a significant component of ethnography that involves extensive

engagement in the field in order to understand the daily processes and experiences of

participants.[59,61] The PI will spend approximately 30 hours per week in the ED "shadowing"

participants to understand the everyday routines of participants across roles (i.e. triage, trauma,

pediatric RNs, RN administrators) on both day and night shifts, weekday and weekends. The

PI will spend time with participants in the setting in order to elucidate events and experiences

of importance as conveyed by participants. Observations will be recorded as *fieldnotes*, or

descriptive, iterative recordings that evoke sensory details about the physical setting,

participant experiences, and events taking place in the field.[24,25,62-64] Fieldnotes will be

recorded by the PI pertaining to: 1) overall impressions of the field (i.e. descriptors of physical environment, size space, equipment), 2) clinical descriptors (i.e. daily staffing, patient census, day shift or night shift trends), 3) events of importance identified by participants (i.e. workflow changes, public health crisis), and 4) reflexive PI notes (i.e. notes on future areas to explore in field, bracketing of biases). Fieldnotes will consist of jottings[62] (abbreviated notes) of sensory descriptions and *informal interviews/conversations* in the field that will later be expanded into full paragraph(s) descriptions within 1-2 days of conducting the field observations. The *informal interviews/conversations* are unstructured interactions with participants in the field that address the interaction between the work environment and RN burnout.[62-64] Such conversations will last 5-10 minutes in duration during non-emergent periods and in HIPAA-protected areas of the ED (i.e. break rooms, clinician workspaces). Conversations will be audio recorded on the PI's recording device and/or in the fieldnotes.

In-depth interviews are semi-structured, formal forms of data collection that will pursue a detailed exploration of topics identified in the field[62-64] (i.e. gleaned through informal conversations with participants and fieldnotes). An interview guide[62] will be created to explore the drivers, manifestations, and consequences of burnout in the ED. Interviews will take place outside of the ED and will be audio recorded with permission.[62]

Artifacts will consist of non-patient related (HIPAA compliant) clinician notes, communication flyers from unit or hospital leadership, and printed workflow protocols.[64] Examples include unit clinician-to-clinician written notes or sketches communicating patient flow through ED zones, flyers about COVID-19, or printed triage workflow protocols depicting where patients get triaged and receive care in the ED.

Data Analysis: Data analysis will begin with data collection and will be a highly iterative process based upon emerging findings in the field.[24,25,62] Codes will be applied to the data using Dedoose Qualitative Software,[65] followed by an identification of how data is situated within the larger context of the SEM framework, emergent categories, concepts, and eventual themes.[62,63] Categories developed across the data sources will be triangulated to identify similarities and differences across groupings.[62,63] Comparisons across SEM level will lead to emerging themes. The data analysis process by specific data collection source is as follows:

Fieldnotes inclusive of data recorded from *participant observation* as well as *informal interviews*, will be analyzed through a thematic analysis[64] process consisting of 1) immersion in the data, repeated re-reading, and 2) line by line analysis and data reduction through open coding. Using both inductive and deductive (based on the SEM framework) coding will be used to create a codebook[62] that will guide data analysis.

In-depth interviews will undergo a thematic analysis[66] process of data immersion, open coding, data reduction and category/concept development. Categories will be triangulated with fieldnote and other data sources in order to enhance the contextual depiction of emerging categories and subsequent themes.[62,63]

Artifacts will be analyzed descriptively, identifying first the communicated message, perspectives involved, the context of the artifact, and the perceived value of the artifact among participants.[64]

Aims Integration, discussed under "Approach" and in Figure 2, will facilitate a comprehensive evaluation of RN burnout costs and will identify indirect costs necessary for inclusion in future, large-scale burnout cost models.

Aim 2 deliverables include a perspective of RN burnout indirect costs that not only

complements the quantitative estimate (Aim 1) of RN burnout, but also addresses cultural

aspects of RN burnout that are not quantifiable through direct economic modeling. Such a

comprehensive evaluation of RN burnout costs will support systems-level RN burnout policies

by contextualizing RN burnout costs to decisionmakers.

Limitations: *Parameter estimates for RN burnout are limited.* The dependability of the

probability and cost estimates from the economic models is inherently compromised in using

secondary data inputs and proxy probability estimates. Furthermore, the study does not include

costs beyond those attributed to turnover and CAUTIs. In alignment with decision analysis best

practices, sensitivity analyses will be conducted to evaluate how changes in probabilities and costs

of turnover and CAUTI can influence the total costs to hospitals.[67]

Markovian assumptions limit accurate reflection of RN progression. Markov models operate under

the assumption that once a RN moves from one state to another, the model is 'memory-less'[22,23],

meaning it does not recall which state the RN arrived from.[41] The model compensates for this

limitation by including a comprehensive set of states that reflect a dynamic selection of RN burnout

transitions in Aim 1.

The PI is an insider in the identified setting. The PI is a former full-time employee in the identified

setting which could enhance research bias. Maintaining rigor in ethnography is both inherently

necessary for the method, and is particularly critical given the PI's insider status. Rigor will be

maintained through 1) credibility (direct participant observation, frequent debriefing, iterative

questioning and interview guide development), 2) transferability (contextual reflection and

review), 3) dependability (audit trail), 4) confirmability (bracketing assumptions, member

checking, committee member debriefing, maintaining reflexive notes). [68-70] Bracketing of

assumptions and the maintenance of a reflexivity journal will be particularly emphasized given the PI's insider status.

Timeline: The study timeline (Table 2) will facilitate successful completion of aims and results dissemination.

Dissemination:

Findings will be presented at scientific research conferences that focus on health economics (ISPOR) and health services research (Academy Health Research Meeting). At least two manuscripts

Table 2: Activity for Study Aims per quarter	Pre-R36	Q1 (2021)	Q2 (2021)	Q3 (2021)	Q4 (2022)
IRB approval for Aim 2	X				
Aim 1 (**Economic models**) Preliminary model creation	X				
Aim 1 (**Economic models**) Literature search for model data inputs		X			
Aim 1 (**Economic models**) Run models/conduct data analysis		X	X	X	
Aim 2 (**Ethnography**) Ongoing recruitment and data collection	X	X	X		
Aim 2 (**Ethnography**) Data analysis	X	X	X	X	
Aims integration: Aims validation, explanation, augmentation, application to future studies				X	X
Dissemination of findings to participants and stakeholders				X	X

will be prepared to disseminate findings in relevant health economics and nursing peer-reviewed journals. Model parameters and structure (Aim 1) and de-identified data (Aim 2) will be published through the Center for Open Science (Charlottesville, VA). Findings will also be delivered to health care leaders at the study site hospital. The results will be developed into a brief for leaders, disseminating information on the direct RN burnout costs and anecdotes gleaned from the ethnography.

HUMAN SUBJECTS RESEARCH

PROTECTION OF HUMAN SUBJECTS

AIM 1 Develop economic models to evaluate the cost of RN burnout for a health care

organization.

The information used in Aim 1 of the study is not considered human subject research. The

information used in this Aim is probabilities and prevalence data obtained from systematic

literature reviews of published research articles. This data (from the literature) was not originally

obtained by the authors for the specific purposes of the proposed research. The data is not

obtained in Aim 1 from an interaction with individual humans. The data obtained for use in the

study is in a format that is not identifiable to humans. There will be no description of identifiers

associated with the data. That data has already been analyzed by the authors who published the

probabilities/prevalence estimates, thus the PI in the proposed dissertation research will not have

access to any of the data or identifiers, only the prevalence and probability estimates. The

estimates are obtained from the following data sources:

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AIM 2: **Utilize an ethnographic approach to comprehensively examine the social and cultural indirect costs of RN burnout within an ED.**

1. **Risks to Human Subjects**

   a) <u>Human Subjects Involvement, Characteristics, and Design</u>

Overall study design: Aim 2 (part of the larger, mixed methods study) is an ethnography that assesses the indirect (i.e., social and cultural consequences) of RN burnout. RN (primary sample) and non-RN employees (PCTs, MDs, unit administrators) with at least 6 months of work experience are the targeted participant groups. This human subjects overview addresses the use of the two sources of data collection for Aim 2, <u>participant-observation and in-depth interviews,</u> in order to assess RN burnout indirect costs.

Justification for human subjects involvement: This study Aim requires the recruitment of human subjects because it involves studying clinicians (RNs and non-RNs) through two data sources, **participant-observations and in-depth interviews** using ethnography, in order to evaluate the indirect costs of RN burnout.

Subject population: The subject population is RN and non-RN employees in the ED. The primary sample is RNs and the secondary sample is non-RN employees (MDs, PCT, unit administrators). <u>Consistent with ethnography, this study will not sample for a specified number of participants, however it is expected that data saturation will be achieved after recruiting approximately 60 participants for in-depth interviews. Previous interviews have already been collected for the PI to pursue this anticipated number (see "Budget Justification" for interview funding details).</u> Approximately 30% of this sample will include non-RN clinicians (i.e.

secondary sample). Participants will be recruited for in-depth interviews through snowball and theoretical sampling techniques. There are no collaborating sites involved in this study given that the study occurs in one setting. The age range for this population is 18 years and older. The participants are not patients and their health status will not be examined. However, participants who believe their health status prevents them from participating in the study will be informed that they should not participate. No vulnerable populations will be included in this study.

b) Study Procedures, Materials, and Potential Risks

Planned resource procedures: The human subjects procedures are designed by the PI with input from the dissertation committee to ensure that procedures maximize privacy, confidentiality, autonomy, beneficence, and respect for persons. The PI proposes 12 months of future fieldwork in addition to the 6 months of fieldwork already completed by the PI (18-month total ethnography planned). Planned research procedures related to Aim 2 include primary data collection through participant-observation (documented in fieldnotes) and in-depth interviews. The proposed data collection procedures are necessary to facilitate an immersive exploration of RN burnout indirect costs consistent with ethnography.

This research material will be obtained through the following means:

- **Participant-observation:** The PI will spend approximately 30 hours per week in the field shadowing, observing, and conserving with participants about the individual (i.e., RN) and interpersonal-level (i.e., RN-RN, RN-patient, etc.) burnout impacts. **Table 2** in "Research Strategy" addresses particular fieldwork observations. To summarize, observations will relate to perceived individual and interpersonal impacts of RN burnout on patient quality and safety outcomes.

- **In-depth interviews:** In-depth interviews will facilitate a more thorough understanding

  of topics explored in the field (**see Table 2**). Consistent with ethnography, in-depth

  interviews will take place until data saturation takes place (approximately 60 interviews).

  Participants will be recruited for interviews through snowball sampling techniques and

  theoretical sampling techniques.

Participants, upon consenting to participate, will be assigned an identification code number

which the PI will use to link them to the data. Participant names will be written on a master list

of identification code numbers along with role on unit (i.e. RN, PCT, MD, unit administrator)

and phone number for contact purposes only for interview scheduling. Identification code

numbers will be randomized so that identification cannot be gleaned from study consent order.

The master list of identification code numbers will be stored as an encrypted file on the PI's

computer. This list will be destroyed immediately after the study period ends.

This study has successfully received IRB approval from the institution.

Sources of materials: The data in this study includes participant-observations documented in

fieldnotes and in-depth interviews.

       Fieldnotes will include information from PI observations and conversations in the field

       and will not include person identifiers. Participants will be assigned an identification

       code number once they undergo consent with the PI. For example, a participant who

       consents to participate in a conversation in the field will be referred to by the

       identification code number in fieldnotes, and not by any person identifier.

In-depth interviews will consist of more formal, in-depth conversations with participants

outside of the field using an interview guide. In-depth interviews will be collected on an

audio recording device. Interviews will be transcribed and scrubbed of any person

identifiers as soon as the interview is finished. Interviews will be labeled by identification

code number and will not include any private identifiable information.

Management and protection of materials and information: After each data collection procedure

(i.e., documenting fieldnotes or completing interviews), the PI will ensure that all person

identifiers are scrubbed from the data. Data will then be transcribed onto the PI's computer and

store in an encrypted folder, as well as on the UVA School of Nursing drive. Printed data from

the study (i.e., consent forms, written field notes, written notes from interviews) will be placed in

the locked file cabinet in the UVA School of Nursing. Only the PI and Keim-Malpass will have

access to study materials. When data is presented to committee members for data analysis, the

data will be completely scrubbed of any identifiers.

Potential risks: Risks to subjects include a breach of confidentiality in their work environment.

The risk of a data breech is low due to the security measures in place at the top-tier academic

medical center. There is an extremely rare legal/privacy risk of a high impact data breech where

highly sensitive information about the participant or employer is released to an interested party,

resulting in significant harm to a participant. An additional risk is emotional distress or

embarrassment for the participants due to disclosure of job-related details. Additionally, the PI is

an insider in the setting having worked previously as a full-time employee in the setting, which

may cause emotional distress/discomfort. The risk of significant emotional distress is identified

as extremely low. All aspects of this study will be conducted in a manner that is HIPAA

compliant and accountable under the responsible conduct of the research protocols active at UVA. There are no financial risks to participants.

2. Adequacy of Protection Against Risks

a) <u>Informed Consent and Assent</u>

Consent will be obtained for this study. There are two forms of consent for this study-- verbal and written—to accommodate the nature of the setting and the current public health crisis. Verbal consent will be used during participant-observations (i.e., consenting participants for shadowing, conversations, observing). Verbal consent will also be used for telephone in-depth interviews given COVID-19 restrictions. Should COVID-19 restrictions be lifted, a written consent will be presented to participants. During the consent process the study will be explained, along with information about the voluntary nature of the study. The participants will be informed that the data they share will be anonymized and de-identified. Participants will be informed that their employee status will not be impacted by participation in the participant-observations/interviews and that at any point if they wish to withdraw from the study, they may. **Participants will also be informed that their supervisor/manager/administrator will not be informed of their study participation, nor consulted for any aspect of the study pertaining to their employee status.** The informed consent process will address the purpose of the study, procedures, confidentiality, risks, and benefits to participation. Capacity to consent will be confirmed by participants' ability to "teach-back" what they were told about the study. Participants will be asked if they have any questions and if they understand all of the procedures outlined in the consent process. Contact information (telephone number) will be obtained for participants only to coordinate interviews for the study. Participants will either sign a written consent form (if conducting in-depth interview in-person) or consent verbally. Both the written

consent and documentation of verbal consent will be kept in a secured file on the PI's computer and in the UVA School of Nursing encrypted file, and within locked file cabinet in the UVA School of Nursing (with Keim-Malpass). Once a participant has been consented (either for participant-observation or interview), they will be assigned an identification code number by the PI (only for PI's knowledge). Participant contact information and name will be recorded with the identification code number in a document that will be stored in an encrypted folder on the PI's computer and in the UVA School of Nursing encrypted folder.

Thus, consent forms, participation identification code number and contact information, fieldnotes, and transcribed in-depth interviews will be collected and maintained securely in an encrypted folder on the PIs computer, as well as in the UVA School of Nursing encrypted file and locked cabinet (if paper document). No other individuals other than the PI and dissertation chair (Dr. Keim-Malpass) will have access to contact information. Contact information for participants will be destroyed following completion of the study.

b) Protections Against Risk

Safety mechanisms to ensure data privacy: The PI and dissertation chair (Keim-Malpass) will rigorously follow procedures to ensure confidentiality of the data. Participants who engage in participant-observation conversations in the field will go through a verbal consent process, will be informed of data collection procedures, as well as the data confidentiality procedures. Participant who participant in in-depth interviews will be taken through a formal consent process where they will be informed of the data collection and confidentiality procedures. The participants will be informed that the data collected will be anonymized and de-identified. A computer file will be created that assigns each participant to a unique identification code number.

This file will be encrypted and password protected. Only the PI and Dr. Keim-Malpass will have access to this file; the file will be destroyed at the end of the study. Only the participant identification code numbers will appear on the interview transcripts. Paper files (i.e. consents) will be stored in a locked file cabinet in a locked office. Data sharing among the dissertation committee will not use participant identifiers only participant identification code number. Participants will be informed that their employee status will not be impacted by participation in participant-observation conversations and/or interviews and that at any point if they wish to withdraw from the study, they may. If feeling embarrassment or any emotional distress during the interviews, participants will be assured that they do not have to answer any questions and can stop the interview at any time. Participants will be informed that if they are feeling any discomfort due to the PI's insider status in the setting, they do not have to participate. Participants will be informed that any information shared in the study setting/ during the study will remain confidential.

Addressing Potential Risks

   Breach of confidentiality about participant recruitment/participation: There is a risk of information breech about participant's involvement in the study among participant colleagues and leadership (i.e. managers/supervisors). **To protect participant confidentiality and prevent this**, the following steps will be taken:

1. The PI will NOT discuss which participants have been recruited for the study at the study site with participant colleagues nor leadership (data will only be discussed with PI committee members)

2. The PI will educate/inform participants about the need to preserve confidentiality and to not discuss study participant with the PI around unit staff or in private spaces with unit staff

3. The PI will verbally consent participants in the field at a time when the participants feel comfortable AND when unit leadership (i.e., managers and supervisors) are not present; participants will be informed that they do not have to participate in the study.

4. Participants will NOT be recruited through leadership members on the unit (i.e., managers, supervisors, etc.)

5. Collected data will be de-identified and stored in encrypted folders (see "management and protection of materials and information")

Emotional distress: There is a risk of emotional distress and discomfort talking about the work environment. The PI will address this risk by:

1. Informing participants that they DO NOT have to participate in the study and that participation does not impact their employment status

2. Informing participants that they can withdraw from the study at any point

3. Identifying subtle non-verbals and verbals from participants that they are uncomfortable in the field and therefore terminating data collection (i.e., ending a conversation with participants, stopping the recording and terminating a recorded in-depth interview, etc.) and following up with participant.

PI as insider: Given that the PI is a former insider in the field, participants may feel coerced into participating in the study. The PI will address this risk by:

1. Informing participants that they DO NOT have to participate in the study if they do not want to

2. Informing participants that conversing with the PI is part of a study and not a conversation in the clinical setting as colleagues

3. Continuously assessing participant knowledge of the study through "teach-back" techniques (i.e. asking participants, 'can you describe to me what this study is and what my role is with the study?')

4. Maintaining rigor and trustworthiness in alignment with qualitative inquiry (see "Limitations" in "Research Strategy")

Overall, study confidentiality will be preserved be ensuring that unit supervisors/leadership are not aware of participants considered for recruitment and/or already recruited. **In other words,** the PI will not communicate with potential participants in the field nor unit and hospital leadership about recruited participants nor participants under consideration for recruitment. **Specifics on study confidentiality are addressed <u>by data source and participant:</u>**

Maintaining Confidentiality for All Participants, by data source:

Participant-Observation	In-Depth Interviews
PARTICIPANT GROUP: RNs	
Maintain rapport between PI and RNs Ensure that PI observations do not interfere with RN work (i.e., cause participants to work differently than they normally would)	Interviews will take place outside of the unit and at a private location or over the phone. No other individuals other than the participant will be informed of where/when interviews will take place. The consent process will be implemented prior to interviews. Interviews will immediately be transferred to PI computer, transcribed, scrubbed of all identifiers

Verbal consent participants prior to shadowing and conversing with RNs	and assigned a participant identification code number.
Record discussions with RNs in fieldnotes by identification code number. Denote participant role (i.e., RN)	PI will not address/bring up other participants during participant interviews
	No emails will be sent such that participants can identify who is in the study
PI will not disclose among unit staff who is participating in in-depth interviews or conversations	Unit administrators (i.e., RN managers, MD leaders, etc.) will **NOT** be informed of participants' participation
PI will inform RNs not to disclose to colleagues their participation in study via PI participant-observation	Participants will be asked NOT to disclose participation in study (i.e., to colleagues, record on resumes, etc.)
	Contact information (i.e. ,phone number) for interview planning will remain confidential with the PI and dissertation chair ONLY.
Participant-Observation	**In-Depth Interviews**
PARTICIPANT GROUP: PCTs, MDs, UNIT ADMINISTRATORS	
Maintain rapport between PI and PCTs, MDs, Unit Administrators	Interviews will take place outside of the unit and at a private location or over the phone. No other individuals other than the participant will be informed of where/when interviews will take place. The consent process will be implemented prior to interviews.
Ensure that PI observations do not interfere with PCT, MD, unit administrator work (i.e., cause participants to work differently than they normally would)	Interviews will immediately be transferred to PI computer, transcribed, scrubbed of all identifiers and assigned a participant identification code number.
Verbal consent participants prior to shadowing and conversing with PCTs, MD, unit administrators	PI will not address/bring up other participants during participant interviews.
	No emails will be sent such that participants can identify who is in the study.
Record discussions with PCTs, MD, unit administrators in fieldnotes by identification code number. Denote participant role (i.e., PCT, MD, unit administrator).	Unit administrators (i.e., RN managers, MD leaders, etc.) and non-administrative groups (i.e., frontline RNs, PCTs) will **NOT** be informed of participants' participation

PI will not disclose among unit staff who is participating in in-depth interviews or conversations. PI will inform PCTs, MD, unit administrators that they cannot disclose their participation in PI participant-observations to colleagues.	Participants will be asked NOT to disclose participation in study (i.e., to colleagues, on resumes, etc.). Contact information (i.e., phone number) for interview planning will remain confidential with the PI and dissertation chair ONLY.

c) Vulnerable subjects

There are no subjects included in this study who are considered vulnerable.

3. Potential Benefits of the Proposed Research to Participants and Others

Study participants will not directly benefit from participation in the study, however expected benefits to society may include the advancement of scientific knowledge. The proposed research will advance knowledge around the comprehensive economic impact of RN burnout as a crucial step to identify effective burnout interventions. The aforementioned minimal risks to human subjects are reasonable in relation to the projected benefits.

4. Importance of Knowledge to be Gained

The knowledge gleaned from the study aim will increase evidence around indirect costs of RN burnout on the clinical unit. This study is expected to outweigh the risks of subject participation by improving knowledge around RN burnout costs in order to support and develop future burnout interventions for clinicians.

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APPENDIX

Table 1: Targeted Fieldnote Observations and Interview Questions

SEM Level: Individual (i.e. RN)	
Targeted Observations	***Understanding of Burnout: Physical, Emotional, Social Manifestations of Burnout***
	RN workspace discussions on intention-to-leave bedside job/reasons for leaving bedside
	RN work on high patient volume days: observing affect changes, verbal reports of stress
	Perceived Impact of Burnout on Quality/Safety
	RN discussions during daily huddles about RN staffing levels
Interview Questions	***Understanding of Burnout: Physical, Emotional, Social Manifestations of Burnout***
	How would you describe what RN burnout is? What causes RN burnout on the unit?
	Do you feel that burnout as affected you personally? If so, how?
	Perceived Impact of Burnout on Quality/Safety
	How does an RN's burnout impact their commitment to patient quality and safety in the ED?
SEM Level: Interpersonal (i.e. RN-RN, RN-Patient)	
Targeted Observations	***Understanding of Burnout: Physical, Emotional, Social Manifestations of Burnout***
	RN reports of collective clinician burnout manifestations
	Perceived Impact of Burnout on Quality/Safety
	RN workspace discussions about general patient safety outcomes (i.e. falls), possible drivers
Interview Questions	***Understanding of Burnout: Physical, Emotional, Social Manifestations of Burnout***
	How does RN burnout impact other workers on the unit?
	Perceived Impact of Burnout on Quality/Safety
	How does RN burnout impact team collaboration for patient care tasks?
SEM Level: Health Care Organization (i.e. unit influence on hospital)	
Targeted Observations	***Understanding of Burnout: Physical, Emotional, Social Manifestations of Burnout***
	RN workspace discussions about organizational well-being offerings within burnout context
	Perceived Impact of Burnout on Quality/Safety
	RN workspace discussions, staff meetings, announcements about HCO quality/safety data
Interview Questions	***Understanding of Burnout: Physical, Emotional, Social Manifestations of Burnout***
	Does RN burnout differ in the ED compared to other units? How do you know?
	Perceived Impact of Burnout on Quality/Safety
	How does RN burnout impact patient care at this hospital, if at all?

Table 2: Manuscript Titles and Journals for Publication

Manuscript	Journal
Evaluating the Cost of Nurse Burnout-Attributed Turnover: A Markov Modeling Approach	*Journal of Patient Safety*
"It's like being in an abusive relationship. You have to ask yourself when you've had enough": An Explanatory Model of Nurse Burnout Revealed through Ethnography	*Social Science & Medicine: Qualitative Health*
Examining the Cultural Impacts of An Emergency Department Move Using Ethnography	*International Emergency Nursing*

CHAPTER 2

MANUSCRIPT 1: **Evaluating the Costs of Nurse Burnout-Attributed Turnover: A Markov Modeling Approach**

(Published in *Journal of Patient Safety)*

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Abstract

Objectives: Burnout is a public health crisis that impacts 1 in 3 registered nurses in the United States and the safe provision of patient care. This study sought to understand the cost of nurse burnout-attributed turnover using hypothetical hospital scenarios.

Methods: A cost-consequence analysis with a Markov model structure was used to assess nurse burnout-attributed turnover costs under the following scenarios: 1) a hospital with "status quo" nurse burnout prevalence; and 2) a hospital with a "burnout reduction program" and decreased nurse burnout prevalence. The model evaluated turnover costs from a hospital payer-perspective and modeled a cohort of nurses who were new to a hospital. The outcome measures were defined as years in burnout among the nurse cohort and years retained/employed in the hospital. Data inputs derived from the health services literature base.

Results: The expected model results demonstrated that at status quo, a hospital spends an expected $16,736 per nurse per year employed on nurse burnout-attributed turnover costs. In a hospital with a burnout reduction program, such costs were $11,592 per nurse per year employed. Nurses spent more time in burnout under the status quo scenario compared to the burnout reduction scenario (1.5 vs. 1.1 years of employment) as well as less time employed at the hospital (2.9 vs. 3.5 years of employment).

Conclusions: Given that status quo costs of burnout are higher than those in a hospital that invests in a nurse burnout reduction program, hospitals should strongly consider proactively supporting programs that reduce nurse burnout prevalence and associated costs.

Introduction

As the largest healthcare professional group in the United States (U.S.), registered nurses (RNs) ensure patient quality and safety across all healthcare settings given their role in patient assessment, intervention delivery, monitoring, and overall clinical decision-making.[12] A plethora of health services research to date demonstrates that an adequate supply of RNs (i.e., safe nurse-to-patient staffing ratios) in health care settings is needed to optimize patient outcomes.[3–7] Hospitals that remain under-staffed and those that have high RN burnout rates are associated with poor patient satisfaction,[8,9] increased patient adverse events (i.e., medical errors, missed nursing care),[10,11] and poor quality indicators[3,12] that impact hospital safety ratings.[4]

RN burnout, defined as emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment,[13–15] is an occupational syndrome[16] that not only significantly impacts patient quality outcomes, but is also associated with poor hospital work environments and high RN turnover rates.[1] Before the COVID-19 pandemic, the national RN turnover rate was 17%[17,18] across the U.S.; current RN turnover rates are projected to increase well beyond this rate[19,20]. Given the ongoing COVID-19 pandemic, it is expected that both RN burnout and turnover will continue to increase as demonstrated by an increase in critical staffing needs across numerous hospital settings and units. RNs that experience burnout are twice as likely to leave their bedside nursing job in comparison to RNs that are not experiencing burnout.[4] This is problematic because RN turnover is costly to hospitals.[21,22] Such rising burnout and turnover rates signals an increased risk of compromised patient quality and safety across U.S. hospitals.

RN turnover is costly to hospitals that spend time and financial resources onboarding and training new RNs, and investing in contract RNs (i.e., travel RNs) to fill staffing vacancies. Contract RNs are typically more expensive for hospitals to hire.[18,21,23,24] The average cost of RN

turnover per RN ranges from approximately $40,000 to $100,000.[18,25] Although the cost of RN

turnover has been established, there remains a gap in health services research identifying the cost

of RN burnout-attributed turnover. This specific distinction is important to establish so that

hospitals may understand the need to invest in systems-level interventions that reduce RN

burnout.[1] Additionally, there are no studies to date that have conceptualized RN burnout costs,

despite recent studies published on physician burnout costs in the U.S.[26] This study aims to fill

this gap by preliminarily studying RN burnout-attributed turnover costs for hospitals. Thus, the

purpose of this study was to develop a cost model that assessed the cost of RN burnout-attributed

turnover for a hypothetical health care organization. This study is important to support health

care work environments for RNs and ultimately improve patient quality and safety outcomes.[41]

Method

This cost-consequence analysis used a Markov structure to evaluate the incremental cost

of RN burnout-attributed turnover at status quo compared to a hospital with a burnout reduction

program. The analysis represents a hypothetical hospital in the U.S. and was conducted from the

hospital perspective as payer. Our analysis focused solely on turnover costs among RNs new to

the hospital (i.e., new-hire experienced RN or a new graduate RN), but could be extended to

model other clinical years of experience, professions and relevant costs. This study consists of a

head-to-head analysis comparing the status quo of RN burnout (termed here "status quo arm") in

a hospital to a hospital with an RN burnout reduction program (termed here "burnout reduction

arm").

Status Quo Arm

The status quo arm consisted of a series of states reflecting the hypothetical progression

of an RN in states of "burnout" or "no burnout" in a hospital over a time horizon up to 10 years

(see **Figure 1**) using a Markov model structure. Model parameters and costs were extracted from

an extensive health services literature search specific to RN burnout and turnover outcomes in

hospitals (see **Table 1**). Costs were adjusted to 2018 $US values and discounted at 3% in

alignment with recommendations from the Panel on Cost Effectiveness in Medicine.[27] Outcome

measures in the model were burnout costs per RN incurred by the hospital and cost per year that

an RN is employed in the hospital, given that RNs spend different amounts of time in the

hospitals under each arm. By tracking years in burnout and total years at the hospital as outcome

measures, the model is able to estimate the total expected years in burnout and the total expected

years at the hospital. The percentage of time spent in burnout within the model was calculated by

dividing *years in burnout* by *years employed in the hospital*.

Burnout Reduction Arm

The burnout reduction arm maintained the same model structure as the status quo arm but

was modified to have a hypothetical reduction in RN burnout attributed to a yearly salary bonus.

The burnout reduction arm reflected a reduction in burnout (approximate 50% burnout reduction

from status quo) based on Brooks Carthon's[8] study on RN burnout rates across hospital work

environments and associated patient satisfaction ratings. The burnout reduction program in this

model was considered an improvement in the quality of the hospital work environment, as

measured by the Practice Environment Scale of the Nursing Work Index and used in Brooks

Carthon's[8] evaluation of RN burnout across hospitals. The differences in RN burnout between

the status quo and burnout reduction arms are attributed to improvements in the quality of the

hospital work environment wherein RNs rate managerial leadership, strong relationships with

interprofessional colleagues, active patient quality and safety programs, and leadership

opportunities in the health care organizations.[8] The policy intervention in this study is a

hypothetical salary bonus, which is used to represent a financial intervention to improve job satisfaction.[40-42] Combined with the attributes of an improved hospital work environment, this hypothetical salary bonus reflects studies in the health services literature describing strategies to improve RN recruitment and retention.[26-27]

In the current study, the prevalence of RN burnout is less in the RN burnout intervention arm compared to the status quo arm, as represented by Brooks Carthon's study[8] evaluating hospitals with RN burnout rates divided into quartiles. Thus, the RN burnout reduction program burnout rates were gleaned from the lowest two quartiles, while the status quo burnout rates were the highest two quartiles.

Model Design

The cost-consequence analysis (see **Figure 1**) was developed using TreeAge Pro (TreeAge Software, Inc., Williamstown, MA, USA, 2019, version 20.2.1).[28] The RN cohort modeled in this study were considered bedside RNs from a general, non-ICU based hospital setting who were new to a hospital (i.e., new hire or new graduate RN). In both arms, the hypothetical model progressed the RN cohort through a series of three primary "states": burnout, no burnout, and turnover (either non-burnout or burnout attributed). The hypothetical RN cohort started in the state of "no burnout" (i.e., 100% of the cohort began in the "no burnout" state) and across model cycles made the following transitions: "acquire burnout", "maintain no burnout", "remain in burnout", or "turnover" (no burnout or burnout attributed) (see **Figure 1**).

When modeling years in burnout, an outcome value of 1 was incurred during each cycle when the cohort was in the "burnout" state; however, no other states incurred the outcome value. This value was used to denote that an RN was in the "state" of burnout and was used to calculate the percentage of time an RN spent in burnout while employed at the organization. When

modeling total years in the organization, an outcome value of 1 was incurred during each cycle when the cohort entered the "burnout" and "no burnout" states. The model structure and states were the same for both the status quo and burnout reduction arms.

Model Inputs

Data for the model were collected from a systematic review of observational studies, randomized controlled trials and case studies on RN burnout and turnover in hospitals. The model inputs (**Table 1**) in this study were RN burnout and turnover rates, gleaned from literature evaluating RN staffing ratios, work environment ratings, RN burnout, and RN turnover rates. Of note, the probability of acquiring burnout increased over the 10 years as reflected in Table 1, to signify an RN's increased risk for burnout as years of experience increased in the work setting.[8] For example, the probability of acquiring burnout in the status quo arm increased for RNs over the 10 years from 35.3% (years 1 to 5 in hospital) to 49% (years 5 to 10).[8]

The probability of acquiring burnout in the burnout reduction arm was derived from Brooks Carthon's[8] study evaluating RN burnout rates across various hospitals in the U.S. The probability of acquiring burnout in this arm was reduced by approximately 50% in this model. Thus, compared to the status quo arm where burnout probability was 35.3% (years 1 to 5) and 49% (years 5 to 10), the burnout reduction arm probabilities were 16% (years 1 to 5) and 26.6% (years 5 to 10).

Turnover costs are the primary costs considered in this study because; 1) it represents a metric of RN supply/demand instability; 2) it is costly, amounting to 0.75 to twice an RN's salary;[29] and 3) it represents a loss of human capital (i.e., RN expertise)[21] that, if invested in, could result in returns (i.e., improved patient outcomes, reduced patient re-admissions)[30] for a hospital. Costs considered in both model arms were turnover costs informed by the Robert Wood

Johnson Foundation Wisdom in Nursing study[31] and by Jones'[29] RN turnover methodology. Turnover costs (see **Table 1**) accounted for RN vacancies, hiring, orientation/training, reduced new RN productivity, decreased RN productivity in pre-turnover phase, and RN termination.[21] Turnover costs in the status quo arm were higher to account for higher RN vacancies compared to the burnout reduction arm. The burnout reduction arm included an additional cost (a policy intervention, see "burnout reduction arm") for all cohort members in the "burnout" and "no burnout" states. This cost was a salary bonus that was 8% of an RN's annual wage, and reflected a type of RN retention policy incentive that would be associated with reducing RN burnout.[32,40]

Sensitivity Analyses

Univariate and multivariate sensitivity analyses were performed to test model uncertainty.[33,34] Sensitivity analyses were conducted in the model with the outcome measure representing total years in the hospital. Sensitivity analyses were performed by varying base case estimates by reported distributions (i.e., CIs, SDs) or by varying the estimates by ±15% of the mean when distributions were not reported in the literature. Probabilistic sensitivity analysis (PSA) was performed using 10,000 Monte Carlo simulations to compare the status quo to the burnout reduction arm. Beta distributions were applied to probabilities (i.e., parameters between 0 and 1) and gamma distributions were applied for costs.

<div align="center">

Results

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The model results (see **Table 2**) demonstrated that a hospital with a burnout reduction program is less costly, retains RNs longer in the hospital (i.e., has lower RN turnover), and RNs spend less time in burnout compared to a status quo hospital that does not address RN burnout. In modeling the cost of RN burnout-attributed turnover over a period up to 10 years, the burnout reduction program cost $40,689 per RN versus $49, 373 in the status quo. The cost of RN

burnout-attributed turnover per year of RN employment was lower in the RN burnout reduction program compared to the status quo ($11,592 vs $16,736 per year). On average, RNs spent more time employed in the hospital with an RN burnout reduction program compared to the status quo (3.51 years vs. 2.95 years). Additionally, RNs spent less time in burnout compared to the status quo hospital (1.1 years vs 1.5 years). Thus, RNs employed in the hospital with a burnout reduction program spent 30% of years employed in burnout, while those in the status quo hospital spent 51% of their years employed in burnout. Approximately 67% of the nursing cohort experienced burnout-attributed turnover over 10 years in the status quo; 47% of the nursing cohort experienced burnout attributed turnover over 10 years in the burnout reduction scenario. Therefore, the burnout reduction arm produced cost-savings compared to the status quo by retaining RNs longer in the organization and reducing RN burnout ($11,592 vs $16,736 per year). Although the hospital with a burnout reduction program included an annual cost of $5,627 (salary bonus) compared to the status quo, approximately $5,144 was saved by reducing RN turnover from reduced RN burnout prevalence each year.

Sensitivity Analyses

Model results were robust to variations in the input parameters. Univariate sensitivity analyses (see **Figure 2**) demonstrated that the model was most sensitive to, 1) the costs of turnover in both the status quo and burnout reduction program, and 2) the probability of non-burnout-attributed turnover. Multivariate sensitivity analyses demonstrated that up until a probability of 20% of acquiring burnout and an RN turnover cost of $70,000 the status quo is preferred in terms of cost (i.e., cost less). Specifically, both variables were changed in one arm (i.e., status quo) while the other arm (i.e., burnout reduction arm) was held constant (and vice versa). In altering status quo variables, the status quo cost less than the turnover reduction

hospital until a turnover cost of $69,000 and non-burnout-attributed turnover probability of 28%. However, RNs still remained in the hospital longer in the burnout reduction program. In varying the burnout reduction arm, turnover costs below $90,000 regardless of non-burnout-attributed turnover probabilities favored the hospital with a burnout reduction program in terms of cost and years retained in the hospital. We also varied the costs of RN turnover and the cost of the RN burnout intervention (i.e., salary bonus cost) in the RN burnout intervention arm. The burnout reduction program hospital was preferred (i.e., cost less and retained more RNs) if the cost of RN turnover was below $60,000, regardless of salary bonus cost. Finally, we varied the probability of acquiring burnout and cost of RN turnover in the status quo arm and found that up until a probability of 20% of acquiring burnout and an RN turnover cost of $70,000 the status quo is preferred in terms of cost (i.e., cost less). At higher burnout probabilities (i.e., 30% and higher) and RN turnover costs in the status quo above $70,000, the burnout reduction is preferred in terms of cost and years retained in the hospital.

The PSA (**see Figure 2**) demonstrated that the hospital with a burnout reduction program was a lower cost scenario (i.e., cost less than approximately $50,000) with more years retained in the organization compared to the status quo (i.e., from 2 to 5 years RN retention in the organization over 10 years). The status quo remained a higher cost option (i.e., within $30,000 to $150,000) with between 2 and 3.5 years retained in the organization over 10 years. Overall, the status quo remained the scenario where RNs spent the least amount of time in the hospital in comparison to the burnout reduction scenario, which proved to cost more.

Discussion

This study is one of the first to establish evidence around RN burnout costs using Markov modeling approaches. The model results demonstrated that a status quo hospital will spend

approximately $16,000 on RN burnout-attributed turnover costs per RN, per year employed.

Alternatively, a hospital that is able to reduce RN burnout by 50% can experience cost savings of

about $5,000 per RN per year employed in the organization. The cost savings in the RN burnout

reduction hospital relate to reductions in RN burnout and associated turnover. Specifically, RNs

in the status quo hospital spent less time employed in the organization compared to a hospital

with reduced RN burnout levels (3.51 years versus 2.95 years). RNs spent approximately 50% of

their years employed in the status quo hospital in a state of burnout compared to 30% of

employed years in the burnout reduction hospital. Overall, reducing RN burnout demonstrated

cost savings in the RN burnout reduction hospital because more people were retained in the

hospital, despite costs added annually due to an RN salary bonus. Considering that RNs are the

largest healthcare professional group in the U.S., identified cost savings are projected to be

significant and should be considered as RN burnout and turnover rates rise due to the COVID-19

pandemic.[30,35]

Results from the sensitivity analyses in this study have important implications for policy

translation to clinical practice. Our results demonstrate that when the RN burnout prevalence is

greater than 20% and RN turnover costs are greater than $70,000, the burnout reduction program

costs less, retains RNs longer in the hospital, and has fewer RNs experiencing burnout. Prior to

COVID-19, RN burnout rates were on average 34% across the U.S., and have since increased to

about 50% during COVID-19.[36–38] Thus, our results signify a critical need for hospital

investment in RN burnout interventions given that RN burnout prevalence is well above 30% at

this time.

Our results also support the need for hospitals to regularly assess RN burnout prevalence

in order to optimally finance RN staffing. Contract RNs (i.e., travel RNs) cost more for hospitals

to hire than permanent RN salaries.[18,21,23] Given that contract RNs are often hired to fill staffing

vacancies, it is imperative that hospitals assess RN burnout regularly to avoid high RN turnover

and the inefficient hiring of travel RNs.[18,21,23] Our model supports the need for hospitals to

regularly assess RN burnout as a means to project financial costs of RN turnover and other costs

associated with burnout such as poor patient outcomes. Using the data from this model, hospital

policies can be created mandating RN-targeted interventions once RN burnout rises above 20%

to 25%. Such interventions could include financial incentives (i.e., salary bonus) or increased

vacation time when RNs pick up more shifts over a pay period. Failing to intervene on RN

burnout represents a financial loss to a hospital from a direct cost perspective, and an indirect

cost perspective as can be modeled in future studies.

The PSA was robust in demonstrating that the burnout reduction program was overall

less costly than the status quo scenario and represented more years in the organization for RNs

ranging from 2 to 5 years. These findings support published research to-date with evidence

indicating that new RNs spend less than 5 years in a bedside job before leaving for a new job

position, but also uniquely identifies differences in RN retention years based on hospital

scenario.[39] These findings demonstrate the need for hospitals to target policies and interventions

specifically within the first 3 to 5 years of an RN's practice, regardless of the hospital climate

(i.e., status quo or with a burnout reduction program). Policies and interventions include offering

financial incentives for RNs as they become preceptors for newer RNs (e.g., salary bonus,

vacation time), instituting mandated staffing ratios, and allocating/distributing RN workload

equitably across clinician groups.[40–42] Additionally, as RNs gain more years of experience on the

unit they can be offered increased educational opportunities (e.g., time off to attend conferences),

and/or tuition reimbursement. Such offerings may aid in RNs feeling supported and valued on

the unit, which is often a driver of RN burnout and turnover. [1,24] The implementation of such

interventions can also, by addressing RN burnout, have an improved impact on patient quality

outcomes, and potentially further cost savings.[1]

This study has limitations that are critical to address. First, the cost model was limited to

RN turnover costs and a salary bonus associated with the RN burnout reduction program. Thus,

it was assumed that the RN burnout costs are related predominately to turnover. This limitation

fails to account for relevant RN burnout costs beyond turnover that are important to nursing, the

patient, and the hospital such as: RN absenteeism, reduced RN productivity (i.e., RN

presenteeism), patient adverse events, and other important factors.[43–45] If these dimensions were

added, however, RN burnout-attributed turnover costs within the status quo would be even

higher, thus making a stronger case for reducing burnout in hospitals. Second, the data informing

this study derived from published literature and not primary data collection. As a result, data

sources may not be generalizable to specific hospital settings. Third, the model assumes that RNs

entering the model are new to the hospital or nursing overall. Although not all RNs are new to a

hospital, this cohort characteristic is beneficial in present day given how travel nursing (i.e.,

contract nursing services) are consulted frequently to account for RN shortages particularly in

the COVID-19 pandemic.[46] Thus, hospitals experiencing a high number of new RNs (i.e., due to

new graduate or travel nursing hiring) can benefit from this data. Additionally, the model does

not "replace" RNs after a portion of the cohort is lost due to RN turnover. Thus, the results from

this study cannot be generalized to all nursing experiences related to burnout and turnover.

Despite the limitations presented from this study, the model and associated findings are a

critical first step necessary to develop programs of research evaluating RN burnout costs in

health care organizations. The National Academies of Science, Medicine, Engineering, and

Medicine state that identifying the economic costs of clinician burnout is a critical first step to understand the true burden of burnout in health care organizations.[1] This study sets the stage for future national research agendas assessing RN burnout costs across the U.S., stratified by health care setting (e.g., emergency department, general medicine, surgical, etc.). By developing a basic structure using Markov modeling to identify RN cohort costs, this study successfully identifies that modeling RN burnout costs is valuable for health care organizations and can demonstrate financial decision-making strategies. As RNs and other clinicians in the U.S. continue to be impacted by COVID-19 from a well-being perspective,[35,47] developing robust decision analytic/economic models assessing RN burnout costs is critical.

Conclusion

The costs of RN burnout-attributed turnover in this study were based on data from published literature on RN burnout and turnover and are considered to have some uncertainty. Despite this uncertainty, the cost models suggest that RN burnout reduction can reduce RN turnover and associated costs. Hospital investments in reducing RN burnout may lead to financial cost savings and increased RN retention in hospitals, which can indirectly positively impact patient quality and safety outcomes downstream.

Acknowledgement

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Tables and Figures

Table 1: Model Inputs and Sources

Model Input	Base Estimate	Sensitivity Analysis Range	Source
Probabilities			
Non-burnout-attributed turnover	0.17	0.11 - 0.28	1,5,17
Acquiring burnout over time 1-5 years (Status Quo) 6-10 years (Status Quo) 1-5 years (Burnout Reduction) 6-10 years (Burnout Reduction)	0.35 0.49 0.16 0.26	0.33 - 0.36 0.41 - 0.49 0.11 - 0.21 0.24 - 0.28	1,7,8,11
Burnout-attributed turnover	0.43	0.20 - 0.52	1,7
Healthcare costs			
Turnover per RN, $ (Status quo)	74,676	36,853 - 102,634	18, 21-24
Turnover per RN, $ (Burnout Intervention)	44,806	36,853 - 102,634	18, 21-24
Salary bonus, $	5,627 (8% increase)	5-10% (4,220-7, 034)	46
Abbreviation: RN, Registered Nurse			

Table 1. Model inputs used for the status quo and burnout reduction arms. Inputs derived from nursing/health services literature.

Table 2: Expected Results of the Base Case Model

| Strategy	Total Cost[a] (US $ 2018)	Cost (US $ 2018) per RN[b]	Years in organization (effectiveness)	Years in burnout
Status Quo	49,373	16,736	2.95	1.54
Burnout Reduction Program	40,689	11,592	3.51	1.10
Abbreviation: RN, Registered Nurse [a]In model simulated up to 10 years [b]Cost per RN per year employed in organization *Table 2*. Increased RN burnout in the status quo resulted in increased RN years in burnout and reduced years retained in the hospital. Alternatively, RNs in a burnout reduction scenario experienced fewer years in burnout and more years in the hospital with reduced hospital costs.				

Figures

Figure 1: Cost-Consequence Model: RN Burnout-Attributed Turnover
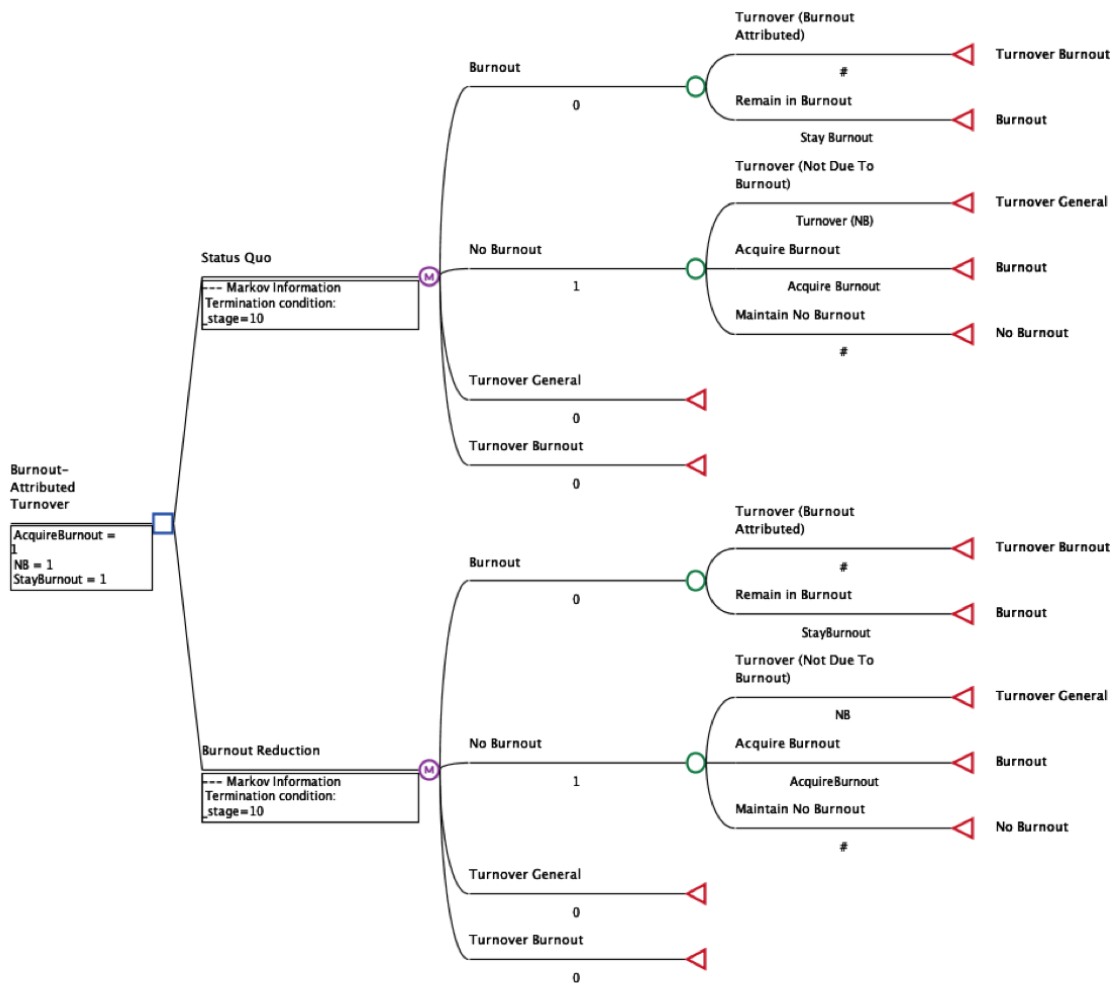
Abbreviation: RN, Registered Nurse

Figure 1. The head-to-head model features Markov models in each arm (i.e., status quo and burnout reduction) to compare hospital costs associated with burnout-attributed turnover.

Figure 2: Tornado Diagram: Univariate Sensitivity Analysis
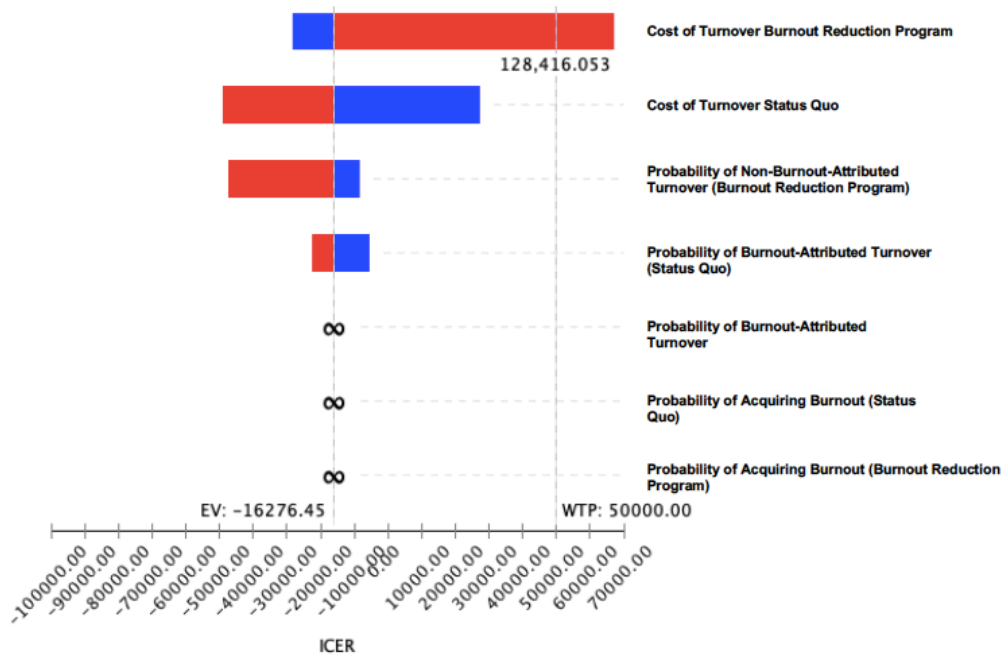
Abbreviations: ICER, Incremental cost effectiveness ratio; RN, Registered Nurse; WTP, Willingness-to-pay.

Figure 2. Tornado diagram indicating variations in input parameters and sensitivity specifically to RN turnover costs and probability of non-burnout attributed turnover in the burnout reduction program. **Note:** red bars indicate a parameter that increased in value from the base case; blue bars indicate a decrease in the base case values. A decreasing, negative ICER identifies low costs and increased years retained in the hospital as outcome measures.

Figure 3: Probabilistic Sensitivity Analysis Scatterplot
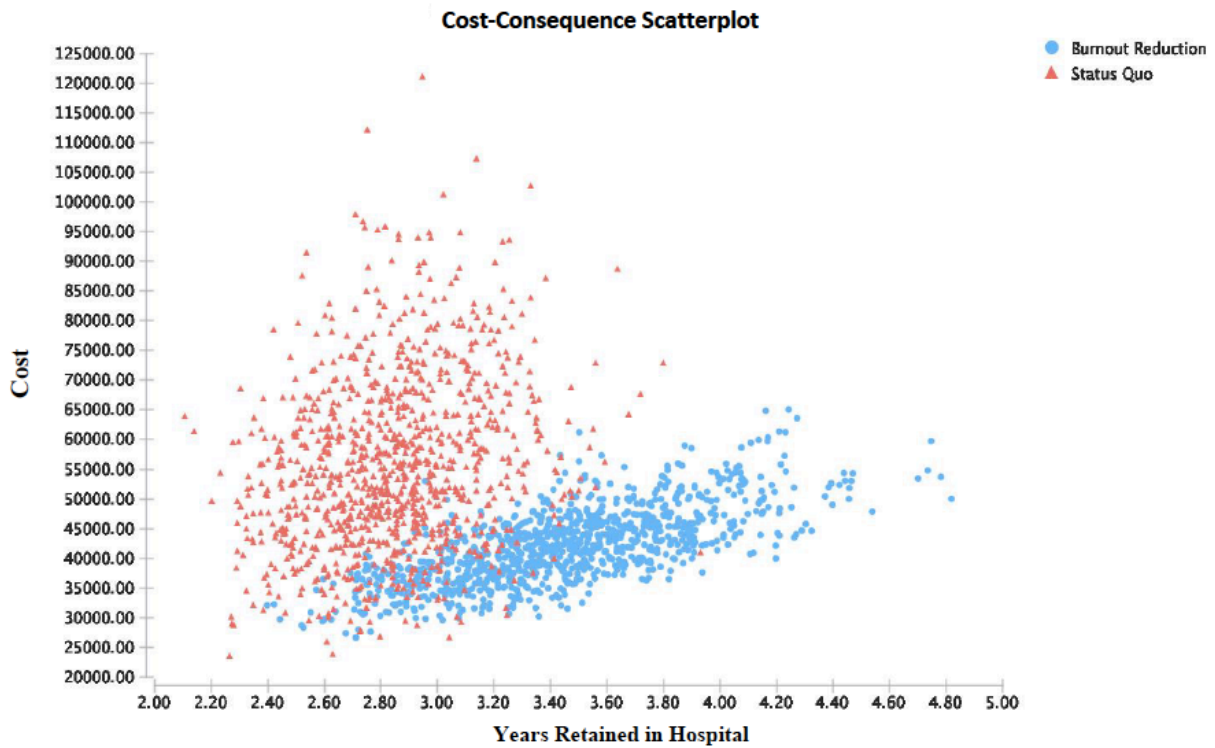
Abbreviation: RN, Registered Nurse.
Figure 3. Probabilistic sensitivity analysis results demonstrated the outcome measure (i.e., RN years retained in the organization) variation in the burnout reduction program compared to the status quo. **Note:** Red triangle indicates the status quo; blue circle indicates burnout reduction program.

CHAPTER 3

MANUSCRIPT 2: "It's like being in an abusive relationship. You have to ask yourself when you've had enough": An Explanatory Model of Nurse Burnout Revealed through Ethnography

(Under review: *Social Science & Medicine: Qualitative Health in Medicine*)

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Abstract

The purpose of this ethnography was to qualitatively explore the multi-level, cultural impacts of registered nurse (RN) burnout. Data were collected over 18-months of ethnographic fieldwork in an academic emergency department (ED) in the United States with a sample of RN and non-RN clinicians. Data sources included participant observations documented in fieldnotes and audio-recorded in-depth interviews. Data collection and analysis were informed by the Social Ecological Model (SEM) and Maslach and Leiter's conceptual dimensions of job burnout. Inductive and deductive coding strategies were used to analyze the fieldnotes and interviews to identify emerging categories and themes. Over 800 hours of participant observations and forty (n=40) semi-structured interviews were completed. Key findings revealed that the experience of RN burnout is similar to the cyclical and difficult-to-escape nature of abuse that can characterize dysfunctional intimate partner relationships. RN burnout results in significant multi-level cultural impacts, best represented by the explanatory model, "The Muir Pathway of Burnout." Fear was a cross-cutting theme across all levels of the model and influenced decisions RNs made about "staying in" or "leaving" the workplace and profession. Individual impacts of burnout included RN withdrawal and a loss of professional identity; interpersonal impacts included loss of team cohesion and inadequate nurse training; on a systems-level RN burnout was perceived as a cultural norm which detracted from necessary interventions and in turn compromised the ostensibly valued culture of patient safety. The Pathway of Burnout can help health care leaders identify where RNs are within the Pathway of Burnout and then inform when, and how, to implement relevant interventions.

Key words: Nurse, burnout, turnover, patient safety, health care, culture.

1. Introduction

"Burnout" was first examined in the field of psychology by Herbert Freudenberger in the 1970s and has been studied within the health care context for over 20 years (Freudenberger, 1974; Aiken et al., 2002). Defined as emotional exhaustion, depersonalization, and a sense of low personal accomplishment, job burnout has been extensively studied within the health care context in order to understand the constraints clinicians encounter in the workplace to deliver safe patient care (Maslach & Jackson, 1981).

Within the United States (U.S.), burnout impacts 1 in 3 registered nurses (RN[1]s), and is associated with poor patient outcomes such as increased mortality risk, health care-associated infections, falls, and other suboptimal events (National Academies of Sciences, Engineering, and Medicine [NASEM], 2019). Although quantitative research approaches have elucidated associations between burnout and patient adverse events [5,11] few studies have examined the less visible, cultural consequences of RN burnout in health care settings (Brooks Carthon, Lasater, Sloane, Kutney-Lee, & Brooks, 2015; Lasater et al., 2020; Poghosyan, L., Clarke, S.P., Finlayson, M., & Aiken, 2010). Specifically, research on the cultural manifestations of RN burnout in complex care settings, such as emergency departments[2], (EDs) is minimal [50,51].

Failure to understand the cultural consequences of RN burnout in complex care settings such as EDs contributes largely to inadequate interventions targeting RN burnout and its detrimental consequences—poor patient quality outcomes, poor job satisfaction among RNs, and high RN turnover rates (NASEM, 2019). Understanding RN burnout in ED settings is critical given that: EDs experience on average over 100 million visits per year in the U.S., EDs are the

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[1] Study Abbreviations: Registered nurse (RN); emergency department (ED); patient care technician (PCT); pharmacist (PharmD); physician (MD); Muir Pathway of Burnout (POB)

primary entry site into the health care system, and many individuals without health care

insurance or access to primary care depend on EDs for their sole health care services. It is also

important to examine cultural consequences of RN burnout in complex care settings such as

EDs, where patient volumes are highly variable, acuity is high, work is fast-paced, and where

RNs care for a wide variety of patients who present in incredibly vulnerable conditions [52]. As

safe RN staffing on health care units continues to be compromised with global pressures

associated with COVID-19, it is critical to examine the cultural consequences of RN burnout in

health care settings (Brooks Carthon et al., 2015; Lasater et al., 2020).

Thus, the objective of this study was to examine the cultural impacts of RN burnout in a

complex care unit (an ED) with a focus on understanding the less visible, indirect impacts of RN

burnout. Culture is defined in this study as the shared beliefs and experiences held by a certain

group [50,53]. Of note, the underlying drivers of burnout, such as RN coping and patient workload,

though important in understanding the culture of RN burnout, were assessed but not the central

focus of this study. In other words, our aim was to comprehensively understand the process and

consequences of burnout versus the antecedents of burnout – which have been extensively

studied and are well-documented (Bakhamis, Paul, Smith, & Coustasse, 2019; NASEM, 2019;

Reith, 2018)

2. Theoretical Framework

The Social-Ecological Model (SEM) informed data collection and analysis in this study [55]

and served as an orienting framework to explore individual, interpersonal, and systems-level

impacts of RN burnout. The SEM is a conceptual framework applied across several health care

and non-health care related disciplines to describe the multi-level, embedded relationships of a

phenomenon on an individual (person), interpersonal (person-to-person, community), or systems

(organizational, national, policy) level. Additionally, data were analyzed across these three levels

to understand how individual experiences of burnout can have broader implications on an

interpersonal and systems-level in the ED setting. Additionally, Maslach and Leiter's (1999)

conceptual characterization of job burnout as emotional exhaustion, depersonalization, and a

sense of low personal accomplishment informed data collection and analysis procedures.

3. Material and Methods

3.1 Setting

The primary field site for data collection was a level-1 trauma/academic medical center

ED located in the southeastern U.S. The ED provides acute adult, pediatric, women's health,

psychiatric, and trauma health care services. Fieldwork took place in the same ED department

over 18 months, which underwent a physical space move 2 months into fieldwork (citation

manuscript accepted with minor revisions by PI)**.** The principal investigator (PI) and first author

(KJM) had insider status through her concurrent work as an ED nurse within the study site,

which facilitated entrée to the field, an emic perspective, and access to key informants and

gatekeepers (Kauffman, 1994). The study received IRB approval prior to data collection (IRB

SBS #2814).

3.2 Sample

Purposive, snowball sampling was used to recruit participants [57,58] both over email and

in-person. The primary sample included RNs who worked either full-time or part-time in any

area of the ED (i.e., adult, pediatric, trauma, etc.). RNs were the primary sample of interest given

their extensive and key role in patient care delivery. Inclusion criteria for the primary sample

included being 18 years of age or older, spending at least 50% of work time delivering direct

patient care, and being employed at the field site for at least 6 months. The secondary sample

included non-RN clinicians such as physicians (MDs), patient care technicians (PCTs), and

pharmacists (PharmDs) who spend at least 50% of their time providing direct patient care and

interact closely with nurses. The secondary sample also included administrators who spend at

least 50% of their time in administrative and/or leadership duties, either within the ED setting or

the general hospital. The inclusion of a secondary sample facilitated an expanded, external

understanding of the cultural impacts of RN burnout.

3.3 Data Collection Procedures

Consistent with ethnography, key data sources included participant observations

documented in fieldnotes and in-depth interviews (Wolcott, 1999). Of note, fieldwork began in

August 2019 and was paused in March 2020 due to the COVID-19 pandemic; during this time

field observations were prohibited and interviews were permitted only over Zoom and/or the

telephone. In-person data collection resumed in February 2021.

3.3.1 Participant Observation

Participant-observations were informed by the theoretical frameworks ((Social-

Ecological Model (SEM); Maslach and Leiter's conceptualization of job burnout) discussed

above with the goal to understand the invisible, cultural impacts of RN burnout on the individual,

interpersonal, and systems levels. For example, Maslach and Leiter's (1999) conceptualization

of job burnout guided participant observations, specifically related to how participants discussed

RN burnout (e.g., the PI positioned herself at RN workstations and listened for RN discussions

relating to Maslach's characteristics of burnout, emotional exhaustion, "I'm drained";

depersonalization, "I don't even care anymore"; low personal accomplishment, "I'm treated like

I'm easily expendable") [14]. Observations related to RN colleague interactions (i.e., RN-RN and

RN-to-non-RN colleague), patient care delivery, and perceptions of the health care environment

within the unit and overall hospital and were informed by a fieldnote guide (see Table

1)(Wolcott, 1985**).** Participant observations were recorded as jottings in the field and later

expanded into full fieldnotes (Emerson, 1995).

3.3.2 Interviews

In-depth, semi-structured interviews were conducted with both the primary and

secondary sample to gain an expanded understanding of RN perspectives discussed in the field.

Participants who engaged informally in the field, for example by sharing specific stories about

burnout experiences and associated impacts, were invited to participate in in-depth interviews.

An interview guide was used to facilitate these conversations (see Table 1) and consisted of

questions informed by the SEM and Maslach/Leiter's conceptualization of burnout [14,55]. The

interview guide was iteratively revised and refined as data collection progressed. Interviews

lasted approximately 60 minutes and were audio-recorded with participant permission.

3.4 Data Analysis

Data were collected, de-identified of personal and institutional information, and stored in

Dedoose Software. Data analysis integrated findings across each data source and was highly

iterative. Dedoose Software [61] supported inductive and deductive coding to identify categories

and themes across the various data sources related to the study aims (Braun & Clarke, 2006;

Wolcott, 1995). Selected participant-observation and in-depth interview data were also exported

to Microsoft Word after initial coding in Dedoose to further explore emerging categories,

themes, and relationships in the data.

3.4.1   Participant Observations

Observation jottings were expanded into full fieldnotes, organized chronologically in

Dedoose, and reviewed in their entirety. Data were then reduced by removing information not

relevant to the study objectives, such as descriptions of RN experiences outside of the ED

unrelated to burnout. An open, inductive coding strategy was initially employed to identify key

concepts relevant to the invisible, cultural manifestations of RN burnout in the ED across the

participant observations (Emerson, 1995). Deductive coding strategies were also employed by

using the SEM and Maslach and Leiter's (1999) conceptualization of burnout as frameworks to

identify emerging concepts.

3.4.2 Interviews

Audio-recorded interviews were professionally transcribed, scrubbed of identifiers, and

verified. Data were analyzed in Dedoose Software (Dedoose, 2016), where open coding was

initially used to identify key concepts. The SEM and Maslach/Leiter's conceptualization of

burnout guided the coding schema for interviews by organizing and analyzing data by level of

impact and by characteristic of burnout. For example, participants described withdrawing from

work as a key consequence of burnout. Data related to this concept were analyzed by identifying

examples of withdrawing from work across all levels of the SEM. Data were also compared to

Maslach and Leiter's (1999) conceptualization of burnout (emotional exhaustion,

depersonalization, and low personal accomplishment).

3.5 Integrating the Data

Integrating interview and participant observation data was facilitated by principles of

thematic analysis (Braun & Clarke, 2006; Wolcott, 1999) which involved comparing codes and

categories from participant-observations and interviews to identify relationships across the data

set. Memoing was used to note similarities and differences between categories, which helped

facilitate the merging of categories to develop higher-level themes [66]. Possible themes were

identified by exploring how categories from participant interviews and observations impacted

one or multiple levels of the SEM and asking, "How do these categories relate to each other?

and, "Do these categories together form a structure, relationship or process? If so, how?". If a

category had multi-level impacts, it was considered a cross-cutting theme. Proposed study

themes were discussed among the investigators; the ultimate consensus was reached that findings

were most accurately and comprehensively represented by an explanatory model/pathway that

visually depicted the process of nurse burnout across all levels of the SEM and one broad, cross-

cutting theme.

4. Results

Over 800 hours of fieldwork were completed between August 2019 and February 2021.

A total of 40 semi-structured interviews (n=40) were conducted with 38 (n=38) participants (two

participants were interviewed twice). The majority of the participants were RNs (n=26, 65%),

and the remaining were non-RN clinicians (n=12, 35%). (See Table 2 for demographic details).

The participants who were interviewed twice were one RN administrator and one MD

administrator to glean a leadership-based perspective on RN burnout specifically during COVID-

19 (July 2020).

Key findings revealed that the experience of RN burnout is similar to the cyclical and

difficult-to-escape nature of abuse that can characterize dysfunctional and abusive intimate

partner relationships. RN burnout results in significant individual, interpersonal and system-level

negative cultural impacts, best represented by the explanatory model, "The Muir Pathway of

Burnout" (POB). Fear was a cross-cutting theme across all levels of the model. The POB

conveys burnout as a predictable trajectory punctuated by decision points such as, "should I stay

in the workplace?" or, "should I leave the workplace?; with accompanying individual,

interpersonal, and systems-level cultural impacts.

Results are presented below first by an overview of the POB (including a discussion of the cross-cutting theme, "Fear"), and then by cultural impacts of burnout to the various levels of the SEM (individual, interpersonal, systems). Within each SEM level, we describe the dilemma RNs face regarding whether to stay in or leave the workplace/profession. Letter indicators (i.e., A, B, C…) before each subsection represent the location on the POB (Figure 1).

4.1 The Pathway of Burnout Overview (Figure 1, A-D)

The POB visually depicts the cultural impacts of RN burnout as understood through a series of critical decision points. Structurally, the POB consists of an initial phase of burnout triggers (see Figure 1, A), a "gateway" decision point about whether to *stay* or *leave*, and then multiple pathway consequences (individual, interpersonal, systems).

During the initial phase of burnout (Figure 1, A), RNs accumulate burnout triggers, or experiences that cumulatively contribute to RN burnout. RN burnout triggers are the "spark" that initiate the burnout pathway. Study participants described primary burnout triggers as feeling under-valued as a clinician and receiving inadequate communication and support from unit and hospital leadership. A common theme expressed by RNs at this stage in the pathway was that of "not being heard".

We're really worsening this burnout because we're not creating a feedback loop with any of our staff and nobody feels like they're being heard. And if they are heard, the problems aren't being solved in such a way that they feel like they're being bought in to how things work and what they're trying to fix [RN #23].

Burnout triggers lead to a "gateway" decision point, or "turnover ideation" (figure 1, B) when RNs begin to actively think about potentially leaving their current work situation. This "turnover ideation" is similar, conceptually, to that of "suicidal ideation", a medical term which

refers to an individual who has reached a state of distress so high that they are actively

contemplating a watershed course of action (suicide) and have begun to formulate a plan to carry

out that action [67] (Figure 1, C, D). Turnover ideation leads the RN to question whether to remain

working in the health care unit or leave for either a new job position in health care or leave the

nursing profession overall. The ideation of turnover was perceived as an "escape" from the

abusive relationship of the work setting and burnout triggers. Participants described turnover

ideation as not necessarily a decision point they wanted to reach, but one that they *had* to act

upon in order to remain engaged and healthy) in their professional/personal lives. RNs

conceptualized turnover ideation as either *staying in* the "abusive relationship" (i.e., unit

workplace) or *leaving* to pursue a more stable environment where burnout triggers were less

prevalent.

> We can only be an afterthought in a relationship, which is what we are in, for so long
>
> before you just throw your hands up and walk away. [RN #16]

After deciding to *stay in the workplace* or *leave the workplace*, the RN encounters further

decision points along the POB that represent the individual, interpersonal, and systems-level

impacts of burnout.

4.1.1 Cross-Cutting Theme: Fear

"Fear" is a cross-cutting, pervasive sentiment that exacerbates the cultural impacts of RN

burnout across the individual, interpersonal, and systems levels of the POB. Fear reinforces the

RN perception that burnout is an abusive cycle from which they cannot easily escape. Added

demands driving burnout increased individual RNs' fear that they could not escape the abuse of

the workplace.

Somehow your worth is tied into being abused like that. Right? Gosh, look at how much

they need me. I gotta stay. [RN #2]

On an individual level, RNs feared that disciplinary action would be taken against them

for practicing within an ED with high RN burnout and unsafe staffing that endangered patients.

In other words, RN participants connected high RN burnout in the ED to unsafe working

conditions that threatened their individual licenses.

I care very much about my patients, first and foremost, but…I do value my license. I've

been saying for weeks something bad is going to happen…I'm driving home… I'm

reviewing, "What if we hadn't got that kid back?", or, "Oh my gosh, that lady sat in the

waiting room for three hours." [RN #13]

On an interpersonal level, fear centered around the perceived inadequacy of RN training

and experience on the unit, and in turn the compromised care of the patient. RNs feared working

alongside RNs with less experience, such as RNs new to the profession or contract/travel RNs

new to the specific clinical site.

I've heard from [new RNs] who come off orientation. They're in the pod by themselves,

there's no one around, and they pop out of a room to get help, because they don't know

what to do in a situation. And there's literally no one around to help them. And so it

creates these dangerous situations. And they recognize that and they want to go to a safer

environment for them to grow as a nurse [RN #5].

On a systems level, RNs expressed fear about the state of hospital-based nursing, and the

nursing profession in general, when working with low RN staffing levels due in part to RN

burnout-attributed turnover. RNs feared that staffing shortages caused by burnout cultivated an

abusive, unsafe work environment and negatively impacted the hiring and training of new RNs.

I fear for the state of nursing, I fear for it, because the new nurses [less than 5 years] they

burn out much quicker... I know that if I was going in right now in nursing my first year

in nursing, I would be "peace out", I would be finding something else in my life. [RN

#16]

In summary, fear is the predominant, cross-cutting theme that RNs associate with the

abusive cycle of burnout. An unsafe work climate fraught with RNs experiencing burnout

exacerbated RN fears that patients would experience adverse events in their care or that RNs new

to the profession would be inadequately prepared to care for patients safely.

4.2 Overview of Burnout Impacts by SEM Level

At each level of the SEM, RNs were faced with the dilemma of, *staying in the workplace*,

or *leaving the workplace* and had to navigate personally experiencing burnout, watching patients

receive suboptimal care attributed to burnout, and operating within a health care system that

perceived RN burnout as a cultural norm. The impacts of burnout depicted in the POB (Figure 1)

are discussed below by each level of the SEM, and by how RNs navigated the decision whether

to stay or leave the workplace/profession. It is important to note that the impacts of burnout,

while situated within a primary level of the SEM, did overlap. For example, RN burnout

contributed to decreased team cohesion, and interpersonal impact.

4.2.1 Individual-level Cultural Impacts

Among RNs who *stayed in* the workplace, RNs coped with burnout either by:

withdrawing from work as a form of self-protection; or hyper-engaging within the work setting

(e.g., participating in multiple committees or consistently volunteering for additional workload

responsibilities) to over-compensate for the detrimental impacts of RN burnout. Cultural impacts

associated with RNs *leaving the workplace* included: 1) RN turnover as self-protection from the harms and "abuse" of RN burnout; and 2) RN turnover perceived as a loss of identity.

RNs compared working in the ED to being in an abusive relationship, specifically due to the increased workload demands placed on RNs and a perceived lack of concern from leadership to address RN burnout and the resulting high turnover on the unit. Abuse drove RNs to the decision point of "should I stay?" or "should I leave the workplace?".

Habit stagnation-- it's hard to fight against something that even you know…even getting treated in a certain way becomes habit. Like, if you're abused year after year after year, eventually, you get used to it. [RN #2]

It's like being an abusive relationship. You have to ask yourself when you've had enough. [RN #16]

Those who stayed on the health care unit felt ultimately responsible for keeping the unit cohesive and functional from a patient care delivery/competency perspective. Such demands caused RNs to either withdraw from work over time or choose to hyper-engage with work to meet the demands. RN withdrawal resulted from not having the tools to adequately manage the increasing demands of working in the ER. The increasing demands placed on RNs (related to low staffing, perceived lack of leadership concern, and no time for self-care) without the tools to cope felt abusive, inescapable, and comparable to drowning.

You're in a position that sucks and you do not have a snorkel. You can't just sit there and drown every day. [RN#2]

In order to stay and survive in the environment, RNs commonly protected themselves by withdrawing and minimizing engagement/participation in activities considered above and

beyond basic work duties, such as helping fellow employees. This negatively impacted team cohesion.

> [Burned out nurses] are just trying to get through their day. That doesn't mean that they don't care. It's just the thing. They have lost that spring to their step. So now [work has] become a job instead of a career. [PCT #3]

> [Burned out nurses] can't help… [they are not] getting up, walking over, helping you do this or that – [they are] no longer doing that. I mean they're like, "I'm kind of over the job. I'm not gonna go above and beyond because I've been so let down and pushed back." They feel like there' s no point in doing that. [PCT #4]

Working on a poorly staffed unit motivated some RNs to remain at the bedside to provide care that was necessary to avoid abandoning patients and fellow colleagues.

> You have your buddy on your left and your right, and you look out for them. But if one of them gets blown away and the other gets blown away, then you self-[preserve] and you know you are still part of a team, no matter how traumatic. What I have noticed is that as a team we are always self-[preserving]. [RN #16]

A second survival strategy on the unit was to remain "hyper-engaged". This manifested as participants joining/leading work committees, training/precepting other RNs, leading key specialty areas of the department (e.g., triage/patient check-in), and/or providing feedback to leadership about unit processes. The act of hyper-engagement was a coping mechanism employed by RNs striving to fix the issues in the abusive workplace. This high level of engagement resulted in RNs feeling excessively responsible for unit productivity and progress.

> I am always feeling responsible for the whole place, not just the patients in one small area. … I feel like [triage] patients are just out there in limbo most of the time with the

poor triage nurse trying to keep anybody from dying and watching other people get mad

and wait. [RN #3]

Additionally, hyper-engaged RNs reported precepting (orienting) multiple new RNs at

one time in addition to taking typical patient workloads. Multiple precepting was due in part to

the lack of experienced or engaged RNs on the unit.

I don't mind precepting, I realize we have to help the new people out. But sometimes you

just want a day at work when you're not having to do that. [RN #13]

Remaining highly engaged at the bedside was a temporary compensatory mechanism for

RNs. Overcompensation by hyper-engagement in order to survive the workplace resulted in

increased accumulation of burnout triggers. Eventually, hyper-engaged RNs invariably became

over-whelmed, further perpetuating the burnout cycle. RNs with good intention to remain

engaged eventually felt the impacts of feeling isolated, abandoned, unsupported, and ultimately

abused as an RN.

…not to say nurses are weak or are stronger than others, but I think that those nurses who

I would usually say take kind of a heavier load are now asking for more breaks, for more

time between their patients. [MD #4]

I told my husband, it feels, like, abusive. And that's where I am… I am so done, I cannot

be in this environment again. [RN #1]

The continued abuse precipitated "turnover ideation" as RNs began to seriously consider

leaving the bedside. To leave was seen as a preemptive action to protect the RN from the toxic

environment and from being responsible for poor patient outcomes.

Something bad is going to happen. There's going to be an incident, there's going to be an

event that happens. So, I'm literally trying to get out. [RN#7]

The decision to leave the unit in order to survive the abusive workplace came at a cost to RN identity. Many RNs who saw themselves as ED clinicians reported that the work environment was professionally incompatible with emergency care as a nursing specialty. Thus, the decision to leave resulted in a loss of identity or self-concept as an RN.

> Some people were born and bred ED nurses and would have never left. … they would never have left the environment. They had to make a [practical] work decision versus [connecting with ED] patient care. They felt like they were compromising their values. [RN#7]

The cycle of RN burnout was perpetuated by the cultural sentiment that some RNs were "cut out" and some were "not cut out" for the ED environment. This dichotomous conceptualization of RN ability failed to acknowledge the role of the health care system in perpetuating RN burnout.

> I was worried…that I wasn't cut out for the ER. I don't know if I can do this. I don't know if I can keep up with this environment. I'm going to [fulfill] my two years and then I'm going to figure out if I need to find a different specialty. [RN#12]

Although RNs who left the work environment sought relief from the abusive workplace and cycle of burnout, they reported fear of a loss of identity after leaving the unit. RNs often reported that they did not want to leave the specialty of ED nursing, but were leaving out of necessity to protect their license and personal well-being.

> I've interviewed in other places, and if they offer me a job, I'm taking it and it makes me super sad because I love ER nursing, and I love my job [RN#13]

Turnover allowed the individual RN to escape from the abusive cycle of burnout, but came at the high cost of loss of professional identity and the RNs' specialty expertise being reallocated to another unit or profession.

4.2.2 Interpersonal Cultural Impacts

Among RNs who *stayed on the unit*, the interpersonal cultural impacts of RN burnout included a loss of team cohesion (inter-professional collaboration) and suboptimal patient care delivery. The impacts associated with RNs *leaving the unit* included heightened staffing shortages which compromised high-quality RN training and patient care delivery. Of note, whether RNs *stayed* or *left*, both pathway choices negatively impacted patient care delivery on the interpersonal level.

Clinicians who stayed on the health care unit while RN burnout increased were at a disadvantage as they watched their team grow increasingly fragmented and felt the impact of team members' withdrawal. The unspoken cultural norm of "self-survival" and "trust no one" permeated the entire team and patient care delivery process.

> If a nurse is burned out, if they're not engaged in their work…it's gonna affect all of the rest of the team members including [PCTs]. It's hard to go above and beyond and be motivated when the people that you're working with are detached and not happy. [PCT #1]

Exacerbating team fragmentation, MDs described high turnover due to RN burnout as a detrimental process contributing to poor inter-professional collaboration.

> We've had so much turnover of the staff that physicians and the team members don't know who their other team members are and who is taking care of who. It almost feels like a pick-up football game on any given shift, so in other words, it's a whole new team,

half the members of which you've never worked with before. So, does that effect patient

care? Yea I think it does in terms of knowing the skills and the weaknesses and not

knowing your teammates effects on patient care. [MD #3]

RN turnover due to burnout exacerbated staffing shortages and the onboarding of new

RNs on the unit. When nurses left the ED, the unit lost an RN with a specialized skill-set and

expertise. As a result, the availability of RN preceptors was limited to newer RNs who

themselves had either just finished orientation or had only around one year of experience. The

lack of experienced staff to effectively precept new nurses resulted in a perceived decreased

quality of RN skills and a loss of team cohesion.

> You have a newer nurse orienting a new nurse, and the skills just aren't there yet. And so
>
> the new nurse doesn't really have a chance to really learn what you need to know. They're
>
> getting the basics, but not the in-depth of some of these more experienced nurses.
>
> [RN#13]

The loss of team cohesion associated with fewer seasoned nurses to train new RNs meant

that new RNs were often left feeling ill-prepared to care for patients in high acuity situations. As

a result, RNs reported "near miss accidents" during clinical shifts.

> I went over to help a nurse the other day, and it was a new nurse. And there was a patient
>
> who had [Congestive Heart Failure] and she had a liter [of intravenous (IV) fluid] going
>
> and I was like, "Whoa", and then there was not one bit of suction in there. There was no
>
> Ambu [respirator] bag. That's wrong. It scared me. Because the patient's fluid
>
> overloaded, he's gonna drop his [SpO2]. I think [the training] is what's getting missed.
>
> [RN #13].

The baby nurses aren't getting trained appropriately, and it's impacting patient care. The

other day, I had to set up an arterial line and the nurse didn't know how to do it. And it

took like 20 minutes to set it up and I lost the arterial line because of it so…that's

problematic just priming it and everything. They didn't know how to do it… because

there's not enough people that have been here long enough to adequately train the new

nurses is the feeling that I'm getting. [MD #6]

Given that RNs operate in highly-embedded teams, the impacts of RN burnout spread to

RN colleagues and the patients they cared for.

4.2.3 Systems-level Cultural Impacts

The systemic impacts of RN burnout, regardless of RNs *staying in* or *leaving the unit*

centered around RN burnout being perceived as a "cultural norm". For RNs *staying on the unit*,

bedside nursing was not considered a sustainable career and drove burnout being normative.

Burnout driving RNs to *leave the unit* resulted in new RNs "entering" the cultural norm of

burnout rapidly into their nursing career. Overall, a lack of systemic intervention on burnout

detracted from the systemic "goal" of achieving a culture of safe, high-quality patient care.

Among RNs who *stayed on the unit*, a cultural norm of burnout was driven by the

perception that bedside nursing was not a sustainable career, particularly in the ED setting. The

ED was not considered suitable for long-term RN work due to high patient acuity, increased

patient volumes, and chronic short staffing. Rather, the ED was a place where RNs would fulfill

2 to 3 years of experience as a stepping stone to graduate school or a less intense clinical work

setting.

What I see is many younger nurses come into the ED to get clinical experience, they get

that clinical experience and then they go on to more congenial work environments that

probably pays more and has better hours. [MD #3]

Working as a bedside RN meant tolerating poorer working conditions inherent to the job.

Such conditions ranged from shift-to-shift changes in workload demands and a lack of shift

breaks. A fear of disciplinary oversight (see cross-cutting theme) exacerbated bedside work.

We have a weird culture that says, like, "We can do this to a nurse". It's like, "We can add

things, add expectations, add things onto their daily things to do, we can create

standardization that they have to follow or they'll get in trouble". But it just doesn't happen

that way for physicians. …I see myself kind of "easily disposed of labor", I'm cheap labor

pretty much. [RN #14]

My initial thoughts from my early years of nursing are just that it's nuts how hard we work,

how it's expected that you just might not get a lunch break half the time and we work 12

hour shifts and you don't get a lunch break and that' s just okay cause that's the way it is.

[RN #3]

Thus, the combined perception that bedside nursing was not a sustainable career plus the

increased workload expectations for RNs staying at the bedside cultivated the cultural norm of

burnout. Systemic interventions to address burnout were critically needed by those that *stayed in

the unit* but were largely unaddressed.

It' s obvious that there is a fix. It' s obvious that someone somewhere knows not only that

[burnout] is happening but knows how to make it not happen, and yet we're doing this every

day… there' s no breaks, there' s no pause. [RN#2]

In terms of burnout… a lot of it comes down to just kind of how things are set up from

above [leadership]. [MD #2]

 In the absence of systems-level burnout interventions, RNs needed to *leave the bedside* in

order to escape the "abuse" of the bedside experience.

I think's it's hard because you don't have that [career] advancement unless you decide

you have the privilege to go back to school. I think that's where it causes nursing to get a

lot of burdens piled on because you're not going anywhere unless you have turned over.

[MD#6]

…if you are really close to [a nurse] they'll kind of mention it to you, maybe a couple

days before [they leave the unit]. [MD#2]

Turnover however, did not eradicate burnout on the unit; rather, it exacerbated systemic

burnout impacts. Specifically, new grad RNs entered the abusive work environment, already

witnessing burnout as a cultural norm. New graduate RNs were exposed to the unit

manifestations of burnout on a physical and verbal level, which cultivated a sense of burnout as

the norm.

I don't know anybody who enjoys being [in the ED] and then you know, everybody

shows it through their body language, you know, their mannerisms and you can feel

it. It's not like any sort of objective thing that I can point to. It' s just an overall vibe.

[RN#3]

Participants discussed how new graduate RNs would traditionally (i.e., when burnout was

less prevalent) be protected from witnessing the "abuse" of workplace burnout by seasoned staff.

However, with increasing burnout and turnover, new graduate RNs were entering the profession

at a disadvantage—predisposed to burnout as a cultural norm from the onboarding period.

…Especially with orientees, I mean, if you're orienting someone and they hear you vent

to me, you can vent to me because we have a different relationship and we get the

system. But if you're over there talking and your orientee hears that... They're not going

to have the context behind it, you know what I mean? [PCT #3]

I can see a progression from the baby nurses when they first show up, and then they get

trained, and they get hard, then cynical and leave. [MD #6]

As RNs *left the bedside* and new RNs were exposed to the cultural norm of burnout, RNs

sought systems-level interventions addressing burnout.

To fix the burnout and the turnover I think we need a top down change. You have to

address all the systemic stuff, the chronic short staffing, the way everything grinds to a

halt because we admit every single person that comes in the door. [RN#3]

Despite RNs *staying in* or *leaving the bedside*, RN burnout without intervention detracted

from the systems goal to cultivate safe, high-quality patient care. The cyclical nature of RN

burnout on a systems level impacted the culture of patient safety in the ED, or the cultivation of

high-quality and safe patient care. Burnout driving high turnover, insufficient training of new

RNs, and a cultural "norm" of burnout had a spillover effect on patient care, creating a "cultural

clash" between hospital patient safety goals and the reality of ED patient care. MDs reported

how, as RN burnout increased on the unit, errors of omission and uncertainty around performing

ED-specific care tasks became a common patient safety concern.

I think a lot of times burnout manifests as people just forgetting to do stuff and like, not

doing things because they're overwhelmed, they are tired or they don't do things well.

"Can you please get [IV] access on this GI bleed patient?" Two hours later… "Oh, still

only one IV…"…I'm only as good as my best nurses are, if I'm in a trauma and I don't

have a good nurse that's getting access and other ones setting up an arterial line and other

ones recording… that is a really good, safe, fun, good teaching environment for everyone

to work in and so I am only as good as the people around me that I'm working with,

right? So if you can't keep your nurses happy and healthy and functioning, well then it

makes my job harder and less safe to do. [MD #6]

Burnout drove a cultural clash between individual RN well-being and systems-level goals of

creating a culture of patient safety and quality. As burnout became normative, patient safety and

quality adverse events additionally became the norm.

5. Discussion

Our results identified an explanatory model, The Muir Pathway of Burnout (POB), outlining

the cyclical nature of burnout, the multi-level cultural impacts of burnout, and the cross-cutting

theme of fear that prevented RNs from escaping the abusive, persistent cycle of burnout.

Individual impacts of burnout included RNs withdrawing or hyper-engaging in work;

interpersonal impacts included compromised team cohesion and professional mentorship (RN

training). On a systems-level, burnout became culturally normative, and, in the absence of

necessary interventions, jeopardized the overarching hospital goal to create a culture of patient

safety.

Our study extends prior work and contributes to the literature in several respects. Our study

aligns with Maslach and Leiter's (2016) findings that individuals in burnout who stay in the job

experience lower productivity and reduced quality of work. Our study found that RNs that *stayed*

on the unit withdrew *or* hyper-engaged with work while experiencing burnout, which ultimately

led to reduced productivity and poor patient quality care. Thus, our study provides a more

nuanced example of how RN coping through withdrawal or hyper-engagement ultimately leads

to reduced work productivity and quality. Our findings also critically demonstrate how, even when RNs choose to *stay on the unit,* which is perceived as beneficial to maintain adequate staffing numbers in the organization, the consequences of compromised patient quality care are just as detrimental as an RN *leaving the unit.*

Our findings also confirm and expand on Fry's (2012) study describing RNs as critical gatekeepers to high-quality patient care. Although our participants similarly endorsed RNs as critical entities to facilitate ED patient care, the bedside RN role was not considered – by both RNs and MDs - a "permanent" or sustainable career. Rather, it was perceived that bedside nursing was a stepping stone for a more congenial work environment or an advanced practice role. This perception limited the implementation of necessary work environment interventions to alleviate burnout, and ultimately advanced RN burnout as an inevitable cultural norm.

Our study frames burnout as "abusive", which relates to published nursing research on verbal abuse and workplace bullying [68,69]. Our results expand on this work by situating RN burnout as an experience similar to a dysfunctional, abusive intimate relationship between the RN and the workplace/system (organization) they operate in, as opposed to two individuals experiencing verbal abuse.

Despite over 20 years of primarily descriptive research identifying the prevalence and drivers of RN burnout, there has been minimal emphasis on effective burnout interventions particularly at the system/organizational level (NASEM, 2019). This is problematic as burnout prevalence rates are at an all-time high (Lasater et al., 2020). A critical and novel aspect of our work is a better understanding of the process of burnout and the subsequent multi-level impacts for individual nurses, healthcare teams, and the organization at large. As such, our model provides a framework for developing tailored interventions from the individual RN to systems level. Given

that a significant amount of RN burnout interventions to-date are limited to mindfulness-based

stress reduction programs [70,71], our study provides the critical evidence needed to develop

systems interventions beyond individual RN coping.

The POB provides a map to foster collaborative frontline RN and hospital leadership

discussions around what stage of burnout an RN (or unit of RNs) is in and what tailored

interventions are needed. The POB should be routinely reviewed and consulted by RNs, non-RN

clinician groups, and unit/hospital leadership to assess RN burnout. Routine use of the POB

should take place (at minimum) during annual performance evaluations, during periods of

significant unit change or transition (e.g., COVID-19), and during shifts in patient safety/quality

metrics (e.g., an increase in patient falls). The POB can be a physical resource that is printed out

as a hard copy and openly posted/provided on health care units as a communication and data

tool. Although health care units currently report RN turnover metrics [39], few institutions report

RN burnout prevalence, which limits adequate intervention on the issue. The POB should be

used in conjunction with survey tools like the Maslach Burnout Inventory (MBI) (Schaufeli et

al., 1996) to identify RN burnout prevalence (MBI), identify where RNs exist on the POB for

tailored intervention, and anticipate potential burnout consequences for early intervention.

Importantly, our work provides important interdisciplinary perspectives related to RN

burnout which are important to inform organizational decisions. We included MD, PCT, and

PharmD participants in our study, which highlighted the impacts of burnout to the broader health

care team. For example, MDs also felt the negative impact of RN burnout in that they described

each shift as a "pick-up football game", unfamiliar with the RN/team skillset they were bringing

into high-stakes patient scenarios. In other words, just as an abusive relationship does not only

affect two individuals caught in a dysfunctional dynamic, our work highlights how RN burnout

does not occur in a vacuum and is not an issue for RNs *alone*. Given increased research around team-based care models [73,74], our work demonstrates the critical need to address the impact of RN burnout on the successful functioning of the entire health care team.

Our results suggest that the cultural norm of RN burnout represents a "cultural clash" against the nation-wide health care goal to create "cultures of patient safety" [75]. The cultural manifestations of feeling chronically under-valued, emotionally over-extended, (NASEM, 2019), and perceived as abused at work reflect a systemic failure to safely protect RNs within a demanding profession that seeks to protect and heal patients. Attempts to cultivate a hospital-based culture of patient safety will be of limited success if systems-level burnout interventions are not implemented to mitigate the burnout cycle (NASEM, 2019).

This ethnography has critical and timely implications for RN burnout in the U.S. and across the globe as COVID-19 as RNs increasingly leave their bedside nursing roles or the profession overall due to burnout [37]. This study highlights that, regardless of if RNs stay or leave the bedside, burnout has negative implications for patient care delivery.

As RN burnout prevalence has risen above 50% in the U.S. during the pandemic [76], targeted and novel policies and interventions must be delivered. Such policies and interventions include basic strategies such as adequate RN staffing on health care units to facilitate equitable and safe workload distribution (Aiken et al., 2002), re-structuring Electronic Health Record workflows to reduce unnecessary work burdens [77], and mandating shift breaks, among other potential solutions (NASEM, 2019). In addition to these "no-brainer" strategies, innovative burn-out mitigation strategies, such as giving new RNs longer orientation periods if they enter short-staffed units, compensating RNs for timely "invisible" services they provide (e.g., language translation), offering vacation hours for any over-time hours RNs pick up, and re-evaluating existing payment

models in health care compensating RNs for more nuanced workloads beyond the catch-all

"room rate" (Rutherford, 2012). Burnout, already considered an epidemic prior to COVID-19 [30],

must be targeted as a priority policy issue if health care systems strive to authentically cultivate a

culture of patient safety [78] .

5.1 Limitations

Data collection for this study took place in one, academic medical center ED setting

within the U.S., which may limit study result transferability/generalizability. However, the use of

multiple data sources and prolonged engagement in the field facilitated a deep understanding of

RN burnout that has applicability to similar health care settings. The PI was an insider in the

field setting as a concurrent part-time employee during data collection which we acknowledge

can influence research objectivity and participant rapport and trust. However, an insider's *a*

priori familiarity with shared group beliefs, key informants, specifics of the setting (e.g.,

understanding the need to get out of the way during a cardiac arrest) and language can expand

the breadth and depth of data collection in the identified setting [79–81] and facilitate a thorough and

balanced perspective of participant insights for data collection [79–81]. Consistent with Lincoln and

Guba's (1985) methodological guidance on study rigor and trusthworthiness, necessary measures

were implemented to ensure study transparency and reflection (e.g., maintaining an audit trail,

memoing, consulting with committee members, and data triangulation).

5.2 Future Directions

An important aspect of burnout not addressed in this study and minimally addressed in the

larger literature base [82,83] is burnout experiences among RNs from historically under-represented

backgrounds (i.e., racial and ethnic minorities, LGBTQ, male RNs). Future studies are needed to

elucidate how RN burnout experiences may vary among these groups in order to further identify

tailored RN burnout interventions. Cultural investigations of burnout among these groups can best inform how organizations can transform into "healthy work environments" [84] that not only aim to reduce burnout, but in turn strive to achieve culturally concordant care [85] for patients. Thus, future studies must explore burnout experiences among historically under-represented nursing groups to maintain a robust and diverse health workforce that reflects the demographic profile of populations in the U.S. and across the globe [85].

Additionally, future studies can further economically evaluate the cultural costs of burnout identified in this study. The findings from this study closely align with economic terms, "spillover effects" and "externalities"[86–88], or the transfer of an effect or phenomenon from one entity to another. Health economics literature on patient caregiver spillover effects can inform the data gleaned from this study [86,89,90]. Specifically, future studies can quantify the spillover effects of RN burnout from an RN to a patient in terms of patient outcomes (e.g., patient falls, errors of omission), or efficiency (e.g., time from triage check-in to imaging). With this data, economic models can elucidate the direct costs of the cultural impacts identified in this study. This data is critically important to further support hospital investment in RN burnout interventions.

3. Conclusion

This ethnography uniquely identifies the cultural impacts of RN burnout within an explanatory model, "The Muir Pathway of Burnout". Burnout was viewed as an abusive, cyclical experience that had individual, interpersonal, and systems-level impacts. Ultimately, RN burnout seriously jeopardized the ability to maintain a culture of patient safety within the ED. This study identified a cyclical pathway of burnout in a complex health care setting that can be applied to other health care units in order to identify key systems-level interventions of RN burnout. Such

interventions are necessary to retain a qualified RN workforce and most importantly to cultivate

cultures of high-quality patient care and safety.

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Tables and Figures

Table 1

Targeted Fieldwork Observations and In-Depth Interview Questions

SEM Level: Individual (i.e., RN)	
Targeted Observations	*Understanding of Burnout*
	RN workspace discussions on intention-to-leave bedside job/reasons for leaving bedside
	RN work on high patient volume days: observing affect changes, verbal reports of stress
	Perceived Impact of Burnout on Patient Care
	RN discussions during daily huddles or in workspaces about RN staffing levels, burnout
Interview Questions	*Understanding of Burnout*
	How would you describe what RN burnout is? What causes RN burnout on the unit?
	Do you feel that burnout as affected you personally? If so, how?
	Perceived Impact of Burnout on Patient Care
	How does an RN's burnout impact their commitment to patient quality and safety in the ED?
SEM Level: Interpersonal (i.e., RN-RN, RN-Patient, etc.)	
Targeted Observations	*Understanding of Burnout*
	RN reports of collective clinician burnout manifestations
	Perceived Impact of Burnout on Patient Care
	RN workspace discussions about general patient safety outcomes (e.g. falls), possible drivers
Interview Questions	*Understanding of Burnout*
	How does RN burnout impact other clinicians on the unit?
	Perceived Impact of Burnout on Patient Care
	How does RN burnout impact team collaboration for patient care tasks?
SEM Level: Health Care Organization (i.e., broader system impacts)	
Targeted Observations	*Understanding of Burnout*
	RN workspace discussions about organizational support within RN burnout context
	Perceived Impact of Burnout on Patient Care
	RN workspace discussions, staff meetings, announcements about HCO quality/safety data
Interview Questions	*Understanding of Burnout*
	Does RN burnout differ in the ED compared to other units? How do you know?
	Perceived Impact of Burnout on Patient Care
	How does RN burnout impact patient care at this hospital, if at all?

Note. Targeted participant-observations and in-depth interview questions served as

complementary data sources.

Table 2: Primary and Secondary Sample Demographics

Variable	n	%
Primary participants	26	100
Position		
Staff nurse	21	80.8
Nurse administrator	5	19.2
Education[a]		
Associate's degree	4	15.4
Bachelor's degree	18	69.2
Graduate degree	4	15.4
Experience[b]		
Department experience	10.35	
Overall experience	5.7	
Secondary participants	12	100
Position		
Physician	7	58.3
Patient Care Technician	4	33.3
Pharmacist	1	8.4
Education		
Associate's degree	3	25.0
Bachelor's degree	1	8.3
Graduate degree	8	66.7
Experience		
Department experience	7.25	
Overall experience	14.6	

Note. Demographic differences between registered nurse and non-registered nurse participants.

     [a]highest degree attained expressed as frequency value

     [b]expressed in years

Figure 1
The Muir Pathway of Burnout Model
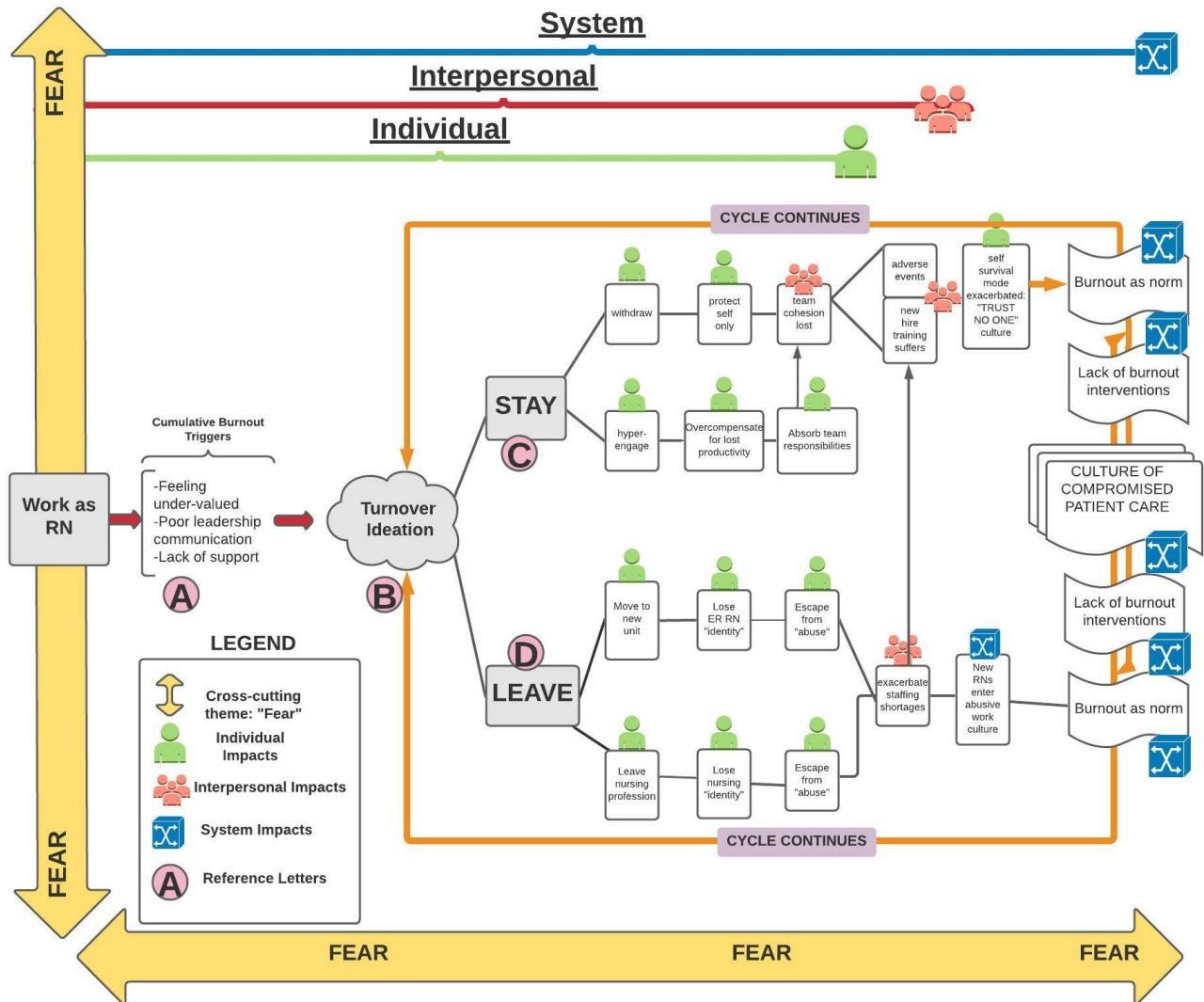
Note. Cyclic pathway reflecting multi-level impacts of registered nurse burnout.
RN= registered nurse

CHAPTER 4

MANUSCRIPT 3: **Examining the Cultural Impacts of An Emergency Department Move**

Using Ethnography

(Published in *International Emergency Nursing*)

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Abstract

Objective: The purpose of this ethnographic study was to evaluate the cultural impacts of an emergency department (ED) move from an old to new physical space.

Method: Fieldwork was conducted over 14 months at an academic medical center ED in the United States. Primary data sources included participant observations and semi-structured interviews.

Results: Over 720 hours of participant observation and semi-structured interviews (n=39) with emergency nurse, non-nurse clinicians, and unit administrators were collected and analyzed. One cross-cutting theme, "decisional power," and three supporting sub-themes "inadequate move preparation," "change fatigue," and "lack of change standardization" were identified. "Decisional power" was the perceived influence certain ED groups had making move-related decisions over others. "Change fatigue" described the impact of frequent change implementation on participants' work processes and job satisfaction. "Lack of change standardization" described power differentials between RNs striving to standardize new move-related processes and MDs implementing work styles discordant with such policies.

Conclusion: Findings can inform recommendations for health care policy and organizational operations such as: 1) including frontline stakeholder perspectives in move-related decisions; 2) allocating adequate time for clinician/employee training/education in the pre-move period; 3) assessing clinician/employee well-being throughout move implementation.; 4) increasing unit administrator sensitivity to clinician change fatigue.

1. Introduction

Change is a particularly salient topic within the health care and emergency department (ED) context, given that patient care delivery processes are highly dependent on clinician ability to adapt to change on a moment-to-moment basis.[52,91,92] As evidenced by the COVID-19 pandemic, change in health care organizations is essential to adequately adapt to rising patient volumes, acuity levels, and the overall uncertainty around a novel illness. As a type of organizational change in health care, ED physical moves (i.e., ED expansion projects or moving to a new ED space) have been studied internationally from an operational management[93] and design perspective in order to optimize clinician workspaces,[94] team communication[93,95], task performance,[96,97] and patient satisfaction.[97,98] Although researchers have examined the impact of ED physical space moves on workflow efficiency,[94,95,99,100] interprofessional communication,[93,97,101] and patient quality,[102–105] very few studies examine the cultural consequences of ED physical space moves as a type of organizational change. For this paper, culture is defined as shared group experiences, dynamics, values, practices/behaviors[50,53]

1.1 Purpose

Examining the cultural aspects of an ED physical space move is important because, 1) the culture of a health care unit influences how change is perceived and implemented; and 2) health care spaces are commonly modified to adapt to patient needs, but the perspective of frontline clinicians (e.g., nurses, patient care technicians, physicians) is not always considered. The purpose of this study was to examine the cultural impacts of a move from an old to new ED space using ethnography.

1.2 Ethnography as Method

Ethnography is a qualitative research method with roots in anthropology that uses extensive researcher immersion in the field to evaluate social phenomena from a culturally-embedded perspective.[65] Ethnography is an appropriate method for this study because it facilitates a rich, highly-descriptive exploration of the phenomenon (i.e., a physical space move) using participant-observation and in-depth participant interviewing.[50,63,106–108]

2. Theoretical Framework

Lewin's Theory of Planned Change (TPC) was used as a guiding theoretical framework for this study in that it informed the participant-observations, interview guide, and data analysis procedures. [109,110] Lewin's TPC identifies three processes as crucial pillars of organizational change delivery: "unfreezing" (i.e., preparing for change/mobilizing individuals for change), "moving/transitioning" (i.e., framing change as a process and identifying plans of actions), and "refreezing" (i.e., embedding and stabilizing the change so that it is integrated into work environmental culture).[109–111]

3. Methods

3.1 Overview

This study is part of a larger parent ethnographic study exploring nurse (RN) burnout in the ED. In this paper, we present results from the first 14-months of fieldwork that relate specifically to the physical space move of the ED from an old to new department. Study approval was obtained from the Institutional Review Board (IRB SBS #2814) prior to data collection.

3.2 Setting

The primary setting and fieldwork location was a level-1 trauma/academic medical center ED located in the Southeastern United States (U.S.) that provides acute adult, pediatric, women's health, trauma, and psychiatric care services. The fieldwork took place in two different spaces of

the same ED-- an original department that was constructed in the late 1980s ("old ED"), and a

second department constructed in Fall 2019 ("new ED").The old ED size was 15,000 square feet,

while the new ED tripled in size - 45,000 square feet. The old ED accommodated 66 patients in

42 rooms (including shared and individual patient rooms) and 24 hallway beds, while the new

ED eliminated hallway beds and had 72 individual patient rooms. The PI and first author (KJM)

gained entrée into the field through her concurrent work as an RN within the ED and pre-existing

relationships with key gatekeepers.

3.3 Sample

Participants were recruited using a purposive, snowball sampling strategy both in-person

and over email.[18,19] The primary sample[57,112] included both full and part-time ED nurses (RNs)

who cared for any type of patient in the ED (i.e., sampling was not limited to pediatric triage, or

trauma-specific RNs). RNs were the primary focus of this study given their critical role in

implementing organizational change and operational decisions (i.e., workflow changes, patient

care protocols) on the frontlines of patient care. Primary sample inclusion criteria included being

18 years of age or older, spending at least 50% of work duties providing direct patient care, and

having at least 6 months of experience working at the fieldsite. The secondary sample included

non-RN clinicians (e.g., physicians [MDs] or patient care technicians, [PCTs]) and

administrators who spent at least 50% of their time in administrative leadership duties, either

within the ED or the larger hospital. Non-RN clinicians and administrators were recruited to

offer an external perspective on the ED move and the role of nursing in adapting to the unit

move. For this study, "frontline clinicians" are considered RNs, MDs, or PCTs who did not

occupy unit or hospital administrative roles; "administrators" are considered clinicians or non-

clinician participants who held administrative roles within the department or hospital.

3.4 Data Collection Procedures

Data were collected by the first author over 14-months of immersive fieldwork (August 2019 – November 2020). Consistent with ethnography, this study used multiple data sources[59,63,65,108,113,114] to understand cultural aspects of the ED move, including participant observation[21,23-24] and semi-structured interviews (n=39). [Note: Due to the COVID-19 pandemic, in-person fieldwork was paused during which time participant interviews were permitted only over the telephone due to IRB institution policy]. Informed consent was obtained from participants.

3.4.1 Participant observation

Over 720 hours were spent conducting observations within the fieldsite (both old and new EDs) with the goal to observe, in alignment with Lewin's TPC, move preparations (i.e., unfreezing), the process of change implementation (i.e., moving/transitioning), and change sustainability (i.e., refreezing). Participant-observations focused on: 1) the PI observing patient care processes within various areas of the EDs; 2) shadowing participants in their day-to-day activities on the unit, and 3) engaging in informal conversations with participants. Observations in the field were recorded as detailed notes about the environment, interpersonal interactions, participant behaviors, and participant perspectives about events taking place.[59,63,108]

3.4.2 Interviews

Both primary and secondary sample participants were recruited for semi-structured interviews with the PI. Additional follow-up interviews were conducted with selected participants (n=2) approximately 1 year after the move took place. An interview guide, informed in part by Lewin's TPC,[52,109,115,116] (Table 1) was developed to direct the interviews and questions were iteratively revised and refined as data collection progressed.

3.5 Data Analysis

Data analysis was a highly iterative process that involved comparisons among emerging findings within fieldnotes and interviews. Analysis involved both inductive and deductive coding of data to identify categories and salient themes.

3.5.1 Participant observations

Jottings (abbreviated notes) recorded in the field were expanded into full fieldnotes by the first author (KJM) within 24 hours after participant observation sessions.[64] Fieldnotes were organized chronologically and edited in Dedoose Qualitative Software (version 8.3.35)[61] and open coding was used to identify emerging concepts related to cultural influences and consequences related to the ED move.

3.5.2 Interviews

Interviews were professionally transcribed, verified and de-identified. Using Dedoose Qualitative Software (v.8.3.35),[61] interviews were coded using a schema that mapped to the interview guide, Lewin's TPC,[109] and emerging concepts identified in fieldnotes.

3.5.3 Integrating the data

A final process of thematic data analysis[62,117] took place in order to understand how categories gleaned from the data sources related or differed from one another. Key categories were identified, compared, and combined across data sources. Categories were identified by patterns of family codes that were similar across data sources; categories that mapped to Lewin's TPC were identified as critical study themes. Data were analyzed to identify possible cross-cutting themes by examining if a category influenced the existence of other salient categories. For example, unit administrator decision-making was identified as an underlying category that influenced participant change fatigue and other categories across the data. Data analysis

continued until data saturation was achieved, as evidenced by no new identification of themes. Emerging themes were reviewed in consultation with JKM and VL and to achieve consensus.

4. Results

4.1 Demographics

A total of 37 (n=37) participants were recruited for semi-structured interviews; two participants (n=2) were recruited for follow-up interviews; overall 39 semi-structured interviews (n=39) were conducted. The majority of participants formally interviewed were RNs (n=26, 70%), followed by MDs (n=7, 19%), and PCTs (PCTs) (n=4, 11%). See Table 2 for additional demographic details.

4.2 Overview of ED Changes in Spatial Configuration

The ED move took place in October 2019. Spatially, the old ED consisted of a centralized workstation where multiple clinicians/clinician groups worked collaboratively in one large generalized care area while the new ED consisted of a pod structure (see Figure 1).

A significant workflow change that emerged after the transition from the old to new ED was the implementation of a rapid medical evaluation (RME) area embedded within the triage area. The conceptual goal of the RME was to triage, treat, and discharge patients who were considered lower acuity (i.e., less urgent) in an efficient time period (i.e., within 2 to 4 hours of patient arrival).[6,29] The RME workflow was iterated throughout the study period. Throughout the results, "triage" refers to the general area of the new ED where various workflows (i.e., RME) were piloted to facilitate patient movement through the ED.

4.3 Themes

One cross-cutting theme, "decisional power", and three sub-themes, "inadequate move preparation", "change fatigue", and "lack of change standardization" were identified related to

the cultural impacts of the ED move. Figure 2 demonstrates the relationship of the study themes. Study themes had a high degree of interrelation in that certain themes informed or contributed to the emergence of other themes, as described below. Specific descriptions and examples of the study themes are summarized below and supported by additional exemplar quotes in Tables 3 to 6.

4.4 Cross-cutting theme: decisional power.

"Decisional power" is the central, cross-cutting theme that significantly impacted all other sub-themes. This theme refers to the level of representation frontline clinicians perceived they had with change decision-making in the ED. Overall, the decisional power of unit administrators and MDs was felt to be more influential than RNs and PCTs, despite RNs/PCTs implementing the majority of the move changes.

> I think [meetings] should be involving the nurses, the techs, the docs and not just one or the other because I feel like everyone has different perspectives and everyone has ideas on their end …. [decisions] could be made better if we were all there bouncing [ideas] back and forth in real time. [RN #33]

A lack of decisional power influenced RNs' and PCTs' belief that move decisions were arbitrary. Specifically, participants felt that move-related changes did not include a communicated rationale prior to implementation, nor adequate preparation (see sub-theme, "inadequate move preparation").

> I think the way that the [new changes] are rolled out impacts the staff dramatically… these changes are coming down from above, and we don't have choices about them. "This is what we're doing-- get on board or get out". Yeah, that's not a great attitude to have in this

department and [I] feel like it's already a stressful environment that we deal with every

day…it creates…angst and separation in a team. [RN #7]

Multiple iterations of change without a rationale for such changes by those holding decisional

power resulted in participants endorsing "change fatigue". A lack of standardization of changes by

those with decisional power (i.e., unit administrators) drove job dissatisfaction and intention to

leave the bedside among RNs and PCTs.

When you roll something out and it doesn't work and you have to constantly make

iterative changes…it feels very schizophrenic and it feels very much like, "well, what is

the flavor today? …it creates confusion for staff and dissatisfaction . [RN #37]

Thus, "decisional power" was perceived by RNs and PCTs to be held most among unit

administrators and influenced which clinician roles were valued in decision-making, what

changes would be implemented, and how they would be implemented on the unit.

4.5 Sub-theme I: Inadequate move preparation.

The first sub-theme, "inadequate move preparation" emerged during the pre-move phase

and was referenced by participants throughout the study period. While the pre-move phase was

meant to prepare participants for the new ED, participants expressed feeling inadequately

prepared for the new ED workflow. This theme is supported by three specific examples of

inadequate move preparation discussed frequently by participants: 1) RME simulations, 2)

solidifying the RME workflow, and 3) orienting to the new ED space.

4.5.1 RME simulations

Prior to the move, the ED planned and conducted at least two simulations about an RME

triage workflow that would be implemented in the new ED. The simulations were led by unit

administrators and allowed select clinicians (i.e., those who voluntarily attended the simulations)

to express their feedback about the workflow. The simulations received mixed feedback from clinicians who felt that although it was beneficial to be exposed to the new workflow, they were not confident that their feedback was heard at the simulations.

> Even though we were technically included in the [simulations] not all of the feedback was really incorporated. So, I feel like we were already dealing with a losing situation, losing battle there [with triage workflow]. [RN #37]

4.5.2 Solidifying RME workflow

Despite the RME simulations, participants perceived that final decisions solidifying the official RME workflow were absent prior to the ED move. Participants agreed that it was important to identify what the triage workflow would be (and receive appropriate training) prior to the move in order to garner universal clinician support and in turn team cohesiveness about this front-end workflow. Clinicians identified that failing to gain consensus on the RME workflow in the pre-move period resulted in various interpretations by clinicians (i.e., MDs and triage RNs) of how to run the triage/RME space on a shift-by-shift basis after the move.

> …I also felt like there was this lost opportunity in that the move represented an opportunity to make a culture change in the new place [with RME]. …It's like moving into a new house but bringing old habits with us. [MD #33]

4.5.3 Orienting to the new space

A final preparation that was perceived as absent, yet necessary, among participants prior to the move was orienting to the new department space. The move represented an extensive increase in square footage (from 15,000 ft^2 to 45,000 ft^2), thus clinicians desired to understand how they would work and collaborate within the new, larger space. Participants expressed concern that they did not receive tours of the new ED until about 3 weeks before the move.

I really wish we had had a tour of the department and learned where everything was and

used stuff before we actually went into it… I would have appreciated a walkthrough of

the ED and really knowing where things were and maybe having like a mock trauma or

something just to know, you know how to set stuff up, how to set the monitors up, like in

the trauma bay…[MD #26]

4.6 Sub-theme II: Change fatigue

Change fatigue was described by participants as being both inevitably challenging, and

an experience that can be exacerbated by certain change implementation stressors, such as the

implementation of "too many" changes (i.e., high frequency of change). Change fatigue

contributed to participant job dissatisfaction and intention to leave the bedside job.

Change fatigue is one of the huge sources of burnout in our department. Over the past few

years, we've lost [turned over] a lot of clinicians because of this. It's a challenge because in

many ways change is inevitable, especially in a setting like an emergency department. …It

certainly has a huge wear on our department… [PCT #19]

Triage represented an area of the ED that negatively shifted the change experience from being

inevitable to being a source of change fatigue. Although RME simulations were performed prior

to the move, participants perceived that not solidifying an RME workflow plan ahead of time

contributed to increased iterations of triage workflow in the year after the move. A total of four

significant iterations of triage workflow were made from October 2019 to the beginning of the

COVID-19 pandemic in March 2020. Change fatigue was reported primarily by RNs and PCTs

who felt responsible for processing, implementing, and evaluating triage workflow changes that

were implemented on a shift-by-shift basis. Participants reported increased stress and job

dissatisfaction at work given the frequent changes to the triage workflow.

… I even feel insecure sometimes about, "Ok, what are we doing today?". And that is a

huge stressor. It's a huge stressor. I never showed up to work feeling stress and anxiety

before I got to these last couple years [RN # 4]

Most of the frustration and stress related to change fatigue stemmed from a lack of clear

communication from those holding decisional power (i.e., unit administrators) about the change.

…when you are in a department that is emergency, leadership has got to be that

disciplined, boring, constant approach that is just trudging the same path and saying the

same thing again and again so the staff know its predictable and that when change comes

out it happens in a specific way [RN #37]

4.7 Sub-theme III: Lack of change standardization

 "Lack of change standardization" was described by participants as the absence of

formally solidifying changes in the new ED. Two examples of these theme involved ED supplies

and variation in MD work styles.

4.7.1 Supplies

Participants perceived that the location of unit supplies was not standardized nor

organized prior to the move and for at least 4 months after the move took place. Specifically, in

the early months after the move, not all storerooms had the same standardized set of supplies,

meaning participants had to search across different storerooms to find specific items. Participants

felt that this wayfinding reduced workflow efficiency and significantly impaired patient safety

and quality in high-stress patient situations such as traumas or codes.

…Finding a product could take upwards to five to ten minutes. I mean, it's inefficient

…we have a lot of stressors in this job. And finding stuff in a storeroom should not be

one of them. [RN #10]

The absence of supply standardization was perceived as an increased workload burden of RNs and PCTs, who relied significantly on supply standardization to deliver high-quality care and to feel professionally competent in their roles in the ED.

> "Why is this not here?" and, "Why are there five different carts with the same thing and I have to walk to another area to get a C-collar?" …You have to keep track of so many things. You should be able to go into every room, close your eyes and go, "Ok rack two, bucket one", and find what you need. [RN #16]

4.7.2 MD Work Styles

MD work styles (i.e., the approaches and preferences that MDs took to implementing patient care workflows) influenced the lack of change standardization in the new ED. MD work style variation manifested in the RME workflow. Participants noted that, despite leadership communications about RME workflow changes to the entire ED, it was not uncommon for MDs to implement the RME workflow in a manner discordant with new unit policy and concordant with previous workflows or their own MD work style.

> There's a different flow for each doctor, and some days they want to do it one way, and in other situations they want to do it that way…so it depends on who's there. [RN#4]

The variations in MD work styles represented a power differential between MD and non-MD clinicians in terms of choosing to accommodate (or not) to new unit changes implemented in the post-move period.

> There were attendings that were [in the ED]…that just didn't want to give up the power of what was being done [in the new RME space]. [RN #28]

Additionally, RNs perceived that they were held to a higher level of accountability for lack of adherence to new unit workflows compared to MDs.

… Nurses are expected to listen to standard behavior and they get chastised or punished

if they don't be that perfect person. [RN #4]

All participant groups identified that change standardization was hampered by varying MD work

styles that were discordant with change standardization protocols (i.e., new unit

workflows/policies).

5. Discussion

This ethnography explored the cultural impacts of an organizational change within the

context of an ED physical space move. The study findings included one cross-cutting theme,

"decisional power", and sub-themes, "inadequate move preparation", "change fatigue", and "lack

of change standardization". The cross-cutting theme, "decisional power" described the perceived

influence clinicians had with move-related decisions. Sub-theme "inadequate move preparation"

revealed that insufficient preparation in the pre-move period not only negatively impacts

clinician workflow processes, but is detrimental to team collaboration and patient care delivery.

Data also indicated that increased frequency of change in the absence of adequate

communication and standardization drove "change fatigue" and job dissatisfaction. Finally, a

"lack of change standardization" highlighted power differentials between MDs and RNs/PCTs in

terms of being held accountable to implement new workflow changes in the ED.

5.1 Study Findings within an International Context

Findings from this study relate to international published data exploring change and space

aspects of EDs. For example, a study in Sweden[101] analyzing semi-structured interviews with

health care staff found that preparing staff for change was essential to engage staff with the

change process (i.e., to see change as valuable and critical to improving patient care). Our study

similarly found that participants desired input in preparing for and implementing changes related

to the ED move. A lack of frontline clinician input in move-related decisions contributed to a culture of job dissatisfaction among RNs and PCTs in the setting.

Additionally, the current study revealed findings similar to those in a Canadian[118] study evaluating RN perceptions of the built environment within the context of quality patient service experiences. Findings from quantitative data/qualitative interviews among RNs revealed that disorganized unit supplies, space layout, and inefficient triage workflow contributed detrimentally to quality patient service. Such findings relate to the current study where disorganized supplies and a lack of standardization of change contributed to a perceived culture of inefficient care processes, change fatigue, and even job dissatisfaction.

This study uniquely identified excessive change and a lack of change standardization as a source of increased clinician workload and job dissatisfaction within the context of a space move. Move-related change was perceived by participants as both inherently challenging, yet a source of fatigue (i.e., "change fatigue") when implemented excessively or in a way that felt disorganized . The concept of change fatigue has been studied within the nursing discipline,[116] and this study contributes novel data by culturally contextualizing the source of change fatigue within the setting of an ED move. In this study, change fatigue was a burden for clinicians because it compounded the intensity of an ED move (i.e., large-scale, multiple dimensions involved) and culturally disrupted clinician job satisfaction and intent to remain working at the bedside.

The ED move importantly revealed an important health care cultural issue related to clinician power differentials. Despite intentions to standardize workflows in the ED, MD work styles varied across the study period, revealing detrimental impacts such as, 1) stalled progress standardizing move-related changes, 2) increased RN/PCT workload burdens adapting to

changing workflows, and 3) disparities in holding specific clinician groups accountable for not adhering to new workflows over others. Thus, this study revealed the cultural dimensions of clinician power differentials and the detrimental consequences to specific groups (i.e., RNs/PCTs) in terms of increased workload and job dissatisfaction.

5.2 Health Policy and Organizational Recommendations

Findings from this study can inform health policies and organizational operations around physical space moves in health care. Specific recommendations can be found in Table 7.

5.1 Limitations

This study took place in one ED within the U.S., and thus could potentially limit generalizability/transferability to other EDs. However, the ED fieldsite represents a typical academic medical center ED within the U.S. and themes related to organizational change within complex health systems are likely to have broad applicability to similar high-resource health care settings. Lastly, it is important to note that the PI had "insider" status[56] as a former full-time RN on the fieldsite unit; appropriate methodological measures were taken to mitigate, and be transparent about, this influence (e.g., transparency with participants about purpose of fieldwork, maintaining an audit trail, memoing, frequent consultation with a research committee, member checks, and data triangulation).[66,119]

6. Conclusion

This study uniquely addressed cultural aspects of an ED physical space move. Data from the study revealed important contextual factors around preparing for a move, implementing change, standardizing move-related change, and understanding interprofessional collaboration within the context of change. Findings support the need to include frontline stakeholder perspectives at all stages of the move-related planning and implementation process. Deficiencies

in including stakeholder perspectives can result in poor cultural consequences to EDs, such as

increased job dissatisfaction and inefficient patient care delivery processes.

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Tables and Figures

Table 1: Interview Guide

1. What was your involvement with the ED move from the old to new space?
2. How did you perceive ED move preparations went?
3. What are advantages to the new ED compared to the old ED? Disadvantages?
4. How have workflows been similar or different in the new ED compared to the old for your role (i.e., RN, MD, PCT)?
5. What opportunities do you see for improving ED workflow related to the move, if any?
6. Can you describe how collaborating with your colleagues is in the new ED?
7. How is your role (i.e., as a nurse, doctor) impacted overall by a change such as a facility move? How do you cope with change?
8. How has COVID-19 impacted changes related to the ED move?
9. How has your well-being as a clinician been influenced, if at all, from the recent move?
10. How can change implementation be improved on the unit overall?

Caption. Interview guide (one of many iterations) used to evaluate cultural aspects of an emergency department move.
ED= emergency department
MD= physician
PCT= patient care technician
RN=registered nurse

Table 2: Study Demographics		
Participant Characteristics		
All Participants		
	Frequency	*%*
RNs[a]	26	70
PCTs[b]	4	19
MDs[c]	7	11
Total	37	100
Unit Administrator participants		
	Frequency	*%*
RNs	5	62
MDs	3	38
Total	8	100
Highest Level of Education		
	Frequency	*%*
Associate's Degree	7	16.2
Bachelor's Degree	19	51.4
Graduate Degree	11	32.4
Total Years of Experience in Healthcare (ED or non-ED)		
	Mean (SD)	*%*
All participants	11.76 (11.8)	*NA*
RN	10.35 (10.5)	-----
PCTs	6 (4.2)	-----
MDs	20.2 (14.2)	-----
Years of Experience in Current ED		
	Mean (SD)	*%*
All participants	6.1 (7.9)	-----
RN	5.7 (7.8)	-----
PCTs	2.5 (0.9)	-----
MDs	9.8 (8.9)	-----

Caption. Demographics describing study participant characteristics.

Abbreviation: No., number, ED= emergency department, SD= standard deviation
[a]registered nurse
[b]patient care technician
[c]physician

Table 3: Decisional Power

…and I think just how there has to be this balance between hearing people' s concerns and also trying to be positive …I think an important part of that is also hearing people' s concerns and hearing them not as like complaints but concerns. [RN #32]

…when [frontline clinicians] have something to say that it would be listened to and not brushed off again as though they're complaining and not raising concerns that affect patient safety and our outcomes [RN #32]

...two of the biggest drivers of people's conflict and anger, whatever they're feeling is a lack of control and a lack of not feeling heard… and that's the two things you do when you make arbitrary changes without consulting anybody [PCT #23]

Caption. Select participant quotes about cross-cutting theme, "Decisional power".

Table 4: Inadequate Move Preparation

RME simulations

And I know [unit leaders] asked for feedback and got some [at RME simulations]. I'm not sure how they planned or how they made the [RME] flow. But I heard that it was sort of doctor run. …I think it would have been better…like, kind of planning it out based on the structure and the rooms and asking for more feedback. [RN #9]

Solidifying the RME workflow

I think we need to make a decision on what the RME process looks like and make it a "on the wall decision", like done. [RN #12]

Orienting to the new space
…it's supposed to be our home that we know where everything is. And we had no idea, and to this day [we]still don't know where some things are.... I just think… there would have been knowledge gained from having a day to just go, "Everyone come in", use it as our staff meeting for that month or for the next two months and have people who are not working in the old ED come in and just [get oriented to the new space] [RN #12]

… I felt the orientation was rushed and superficial… they were still doing construction on the trauma rooms the day we were moving in. [Staff] really needed to see the layout and we really needed to run scenarios... [RN #37]

I felt like [the move] was very rushed at the end. It was this "hurry up", we're like doing so much to get it on time. I think that was a huge disappointment to me. We wanted to get it open on time but we were literally like pulling stuff out of the boxes the day before, assembling stuff and, you know, I think in many situations like this, once you like put a piece of furniture down in the living room nobody moves it. [MD #8]

Caption. Select participant quotes about sub-theme, "Inadequate move preparation".

Table 5: Change Fatigue

Change as Inevitable
…in many ways change is inevitable, especially in a setting like an emergency department [PCT #19]

I think that change is really difficult no matter where you are. [MD #17]

Change Fatigue
…you do a change, and they tweak the change, and then the change goes back to the original way and then it starts and then it's just not one thing its multiple things [RN #4]

I just think that when you're unhappy at your work, when you feel overworked, stressed out, nervous, people don't sleep. I hear people all the time telling me they cannot sleep before work, that is terrifying to me. Can you imagine how the patients must feel? [RN #32]

I think we as nurses get more increasingly frustrated… coming in—you're working one day, you know you're three days off—you're off for three or four days and coming into something that changed that you never heard about [RN #27]

…I think the [RME] change by itself would have been a stressful thing that could cause people to [turn over] plus now the change is not…we're not learning from the change. We're not taking that knowledge and applying it. [RN #12]

Caption. Select participant quotes about sub-theme, "Change fatigue".

Table 6: Lack of Change Standardization

Supplies

There are still some bugs that should have been worked out, as simple as the store rooms are not all standardized, and it's been two months. [RN #10]

…it's supposed to be our home that we know where everything is. And we had no idea, and to this day [we]still don't know where some things are.... I just think… there would have been knowledge gained from having a day to just go, "Everyone come in", use it as our staff meeting for that month or for the next two months and have people who are not working in the old ED come in and just [get oriented to the new space] [RN #12]

MD Work Styles

And I know that [leadership] has been saying, "Let's get standardized, let's get standardized". And the problem is, is that you've got all these different doctors [in triage]…" [MD #15]

…and it's a lot of work to change your practices a lot of work to standardize what everyone's doing. And if not everyone's doing it, why should I? Why should I put in all this work to like, police my co-workers and make sure we're all doing the same thing? Because I know that that other person doesn't support that work anyway, right? And I have to work with them. And now they're like, "I don't want to do it that way". And so it like, really a couple people can really make things toxic, which then I think in terms of burnout, if you come in every day, and you don't know who you're going to work with… are they going to support what you think you're supposed to be doing? Or are they going to be asking you to do something else? What a confusing place to work in… [MD #17]

Caption. Select participant quotes about sub-theme, "Lack of change standardization".

Table 7: Recommendations for Physical Space Moves in Health Care Organizations			
Cross-Cutting Theme: Decisional Power	**Theme I: Inadequate Move Preparation**	**Theme II: Change Fatigue**	**Theme III: Lack of Change Standardization**
Recommendation 1: Plan change delivery discussions (i.e., meetings) during times accessible to clinicians/employees and/or offer several meetings to accommodate clinician schedules. Record meetings for clinician review if unavailable to attend meetings.	**Recommendation 1:** Incorporate key frontline stakeholders in change planning committees (i.e., at planning meetings both intraprofessional and interprofessionally; staff meetings).	**Recommendation 1:** Prioritize key changes necessary to improve patient care delivery; condense or eliminate changes that may be duplicative or incompatible with frontline practices.	**Recommendation 1:** Consult published research about change delivery practices relevant to the type of change under consideration (e.g., unit expansion project).
Recommendation 2: Maintain frequent (i.e., minimum weekly) communication (i.e., email, text messages, staff meetings) about change delivery to ensure transparency and adequate unit preparation.	**Recommendation 2:** Allocate adequate time for education and adaptation to new practice protocols and workflows (i.e., at least 6 months prior to move). Conduct question and answer sessions for clinicians/employees.	**Recommendation 2:** Consult with frontline groups (i.e., non-administrative RNs, PCTs, MDs) about allocation of change workload and perceived clinician burden.	**Recommendation 2**: Develop policies for change delivery, evaluation, and stakeholder inclusion that standardize change practice (i.e., written policies communicated over email, printed policies accessible on unit at all times).
Recommendation 3: Identify, recognize, and value the efforts of groups involved with change delivery at all levels through: staff meeting recognition, opportunities to hold leadership positions on unit, recognition during ED move commemorative events.	**Recommendation 3:** Engage in iterative change implementation and evaluation practices wherein frontline perspectives are consulted to assess change practices and ask questions.	**Recommendation 3:** Identify methods (e.g., using validated clinician burnout surveys) to assess clinician well-being prior, during, and after change implementation practices (i.e., a move).	**Recommendation 3:** Engage RNs and other clinician groups in research and dissemination that assesses the effectiveness of change delivery in ED setting.

Figure 1: Physical Space Expansion from Old to New Department
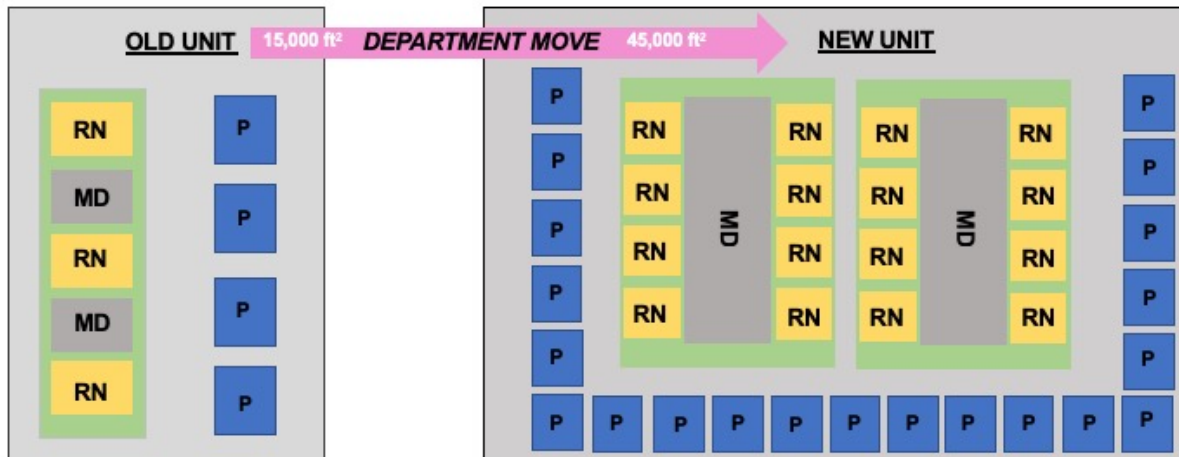
Caption. Physical space reconfiguration from a centralized to de-centralized structure with designated workspaces before and after emergency department move.
 MD=MD workspace, RN= RN workspace; P= Patient room

Figure 2: Identified Relationship Between ED Move Themes
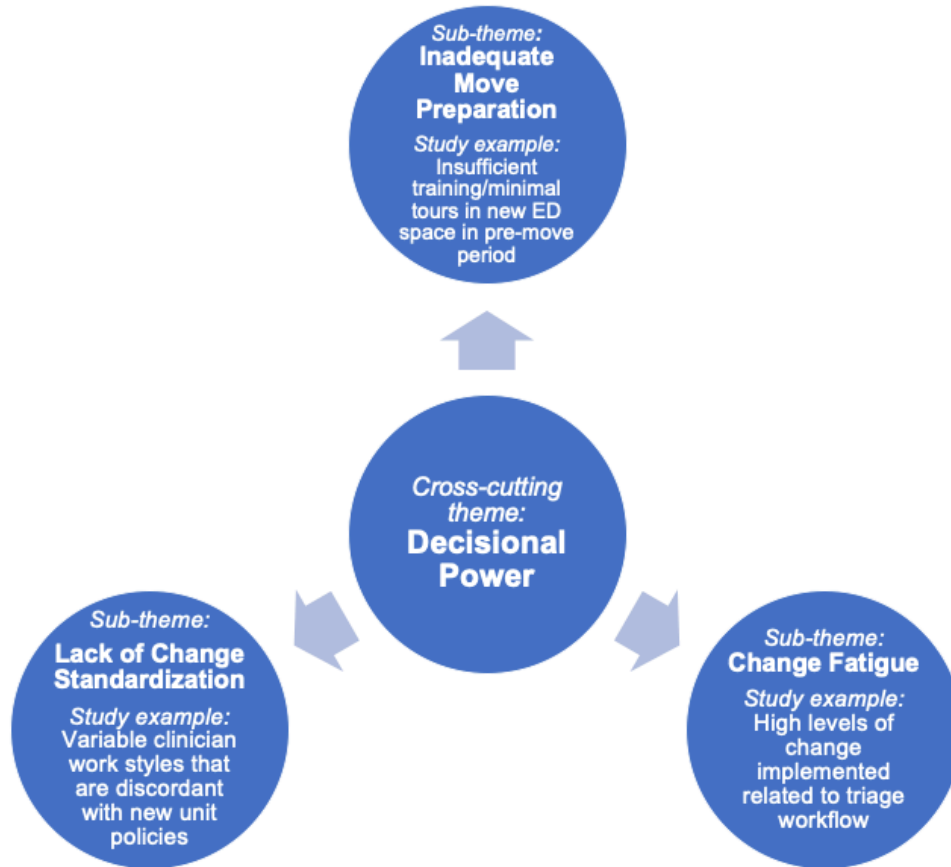
Caption. Cross cutting theme, "Decisional power" and relationships across four change-related sub-themes associated with the emergency department move.

CHAPTER 5: CONCLUSION

Summary of Research

The purpose of this multi-modal study was to evaluate the direct and indirect costs of RN burnout for a health care organization. Direct costs were assessed through a head-to-head Markov model evaluating RN burnout-attributed turnover costs. Indirect, social and cultural costs were explored through an 18-month ethnography in an ED. The SEM served as a theoretical framework for assessing multi-level RN burnout costs. Chapter one of the dissertation included a background of relevant study literature and an overview of study Aims and approach. Chapters two, three, and four include the Markov modeling and ethnography results from study Aims 1 and 2. This chapter includes a summary of study Aims, a synthesis of the dissertation research, applications to health care research, study limitations, and future research studies.

Study Approach Modifications

After rigorous review of the dissertation proposal through the AHRQ R36 dissertation grant process, Aim 1b (patient CAUTI costs) was eliminated to best reflect study objectives and methodological rigor in December 2020. Thus, Aim 1 assessed direct costs specific to RN burnout-attributed turnover solely. The only modification to Aim 2 was a change in title to, "Explore the indirect costs of RN burnout in an ED using ethnography".

Overview of Findings

Aim 1 Summary

The objective of Aim 1 was to evaluate the direct costs of RN burnout-attributed turnover for a health care organization using Markov modeling approaches. Our results (manuscript 1) demonstrate that a hospital spends an expected $16,736 per RN per year employed on RN burnout-attributed turnover costs when costs are modeled over 10 years. In a hospital aiming to reduce RN burnout prevalence through an intervention program, such costs are $11,592 per RN

per year employed. RNs spent more time in burnout in the status quo scenario (i.e., hospital with

higher RN burnout) than the hospital with a burnout reduction program (1.5 years vs. 1.1 years

of employment), as well as less time employed at the hospital (2.9 years vs 3.5 years of

employment). Our results indicate that RN burnout results in higher costs to health care

organizations given that RNs remain in the organization for less years and, while employed,

experience more burnout. Hospitals can experience cost savings of approximately $5,144 per RN

per year by investing in a hospital reduction program. Our results support the need for hospitals

to implement interventions that reduce the prevalence of RN burnout given that RN vacancies

result in higher costs to hospitals in the form of onboarding new RNs (i.e., permanent and

contract RNs), working with poor staffing, and encountering patient adverse events.[1]

Aim 2 Summary

The objective of this Aim was to identify the less visible, cultural costs of RN burnout in

an ED using ethnography. The SEM was used as a theoretical framework to identify individual,

interpersonal, and systems-level costs of RN burnout. Findings from this Aim included an

explanatory model, the Muir Pathway of Burnout (POB) model (manuscript 2), and a model

"exemplar" of RN burnout demonstrated through a physical space move (manuscript 3).

RN burnout had multi-level impacts to RNs, patients, colleagues, and the larger health

care system. As demonstrated through the POB, burnout was described as cyclical and abusive.

Specifically, participants compared RN burnout to being in a dysfunctional, abusive intimate

partner relationship. On an individual level, burnout caused RNs to either withdraw or hyper-

engage with work; interpersonal impacts included compromised team cohesion and suboptimal

RN training; on a systems-level burnout became a cultural norm that compromised the ostensibly

valued hospital culture of patient safety.

The ED physical space move (manuscript 3) represented an exemplar (i.e., case study) experience situating RN burnout within the context of patient care delivery and organizational change. Study findings revealed that during a significant period of change related to an ED physical space move, RNs felt that they lacked decisional power, or value in providing input about significant unit changes. Participants perceived that inadequate move preparation resulted in participants feeling ill-prepared to work in their space, unsure of where to access necessary items for patient care. Change fatigue resulted from high frequency change implemented without adequate preparation and inclusion of RN perspectives and resulted in RN burnout and turnover. Finally, a lack of standardization caused RNs to work with daily iterations of patient workflow on a day-to-day basis. Overall, the study provided a specific example of a transitionary period on a unit that, without adequate preparation and representation of RN perspectives, can exacerbate existing RN burnout, job dissatisfaction, turnover, and compromised patient care. Thus, this exemplar overlapped significantly with themes addressed in the POB such as: feeling under-valued, lack of leadership communication (POB "burnout triggers") leading to burnout, turnover (POB "turnover ideation") and compromised patient care (POB "systemic impacts").

Full Dissertation Summary

The economic modeling and ethnographic approaches in this multi-modal study demonstrate that RN burnout imparts multi-level direct and indirect costs to a health care organization. The direct costs identified in Aim 1 demonstrate that the financial burden of RN burnout can be articulated for hospital investment in RN burnout interventions and improved patient care. The indirect, cultural costs explored in Aim 2 describe how RN burnout impacts exists beyond directly measurable financial outcomes and detrimentally impact individual RNs, patients, the health care team, and health care systems. Dissertation study results establish the

foundational work necessary to build future large-scale economic models assessing RN burnout, inclusive of the social and cultural costs.

Limitations

This dissertation has important limitations that are important to address. Study Aim 1 was limited in terms of study sources, given that the probabilities and costs derived from published secondary literature. The model results may be less generalizable compared to study probabilities and costs deriving from a single, large data source. Additionally, our Markov model inherently had "memory-less" properties, meaning that the cohort model did not account for where the cohort "existed" previous model states. This structure limited a true translation of the RN burnout experience into the Markov model structure, and potentially limits result generalizability and rigor. However, the Muir Pathway of Burnout in Aim 2 accounts for these nuances and thus can inform future studies that may overcome this model limitation in the future.

Data collection in study Aim 2 took place in a single setting, which is consistent with ethnography to ensure depth and breadth of data collection. Although the ED is unique in its patient care delivery demands, the experiences of RN burnout reflected in our results are expected to be generalizable across nursing work environments/specialties. Finally, the PI was an insider in the ED which may have limited participant rapport building and study objectivity. Despite these limitations, the insider status[2] can also be considered a position that facilities in-depth data collection given an insider's prior knowledge of the social group and participants. The PI maintained rigor and trustworthiness methods consistent with Lincoln and Guba[3,4] throughout data collection and analysis.

Implications

The dissertation study results have important implications for health services research, patient care delivery, and health care policy. First, this study fills a gap in health services and nursing research given that, 1) the cost of RN burnout-attributed turnover is under-studied; 2) estimates of RN turnover costs are outdated;[5] and 3) RN burnout is a world-wide crisis necessitating policy development and implementation. Given rising RN burnout and turnover rates during the COVID-19 pandemic,[6–8] understanding RN burnout costs elucidated in Aim 1 is critical for health system decision-making about staffing investments. Both RN staffing shortages and RN contract (traveler) services[9] are expensive for health systems, and this study provides information on financial investments needed to address RN burnout. A health system can specifically use this information to understand the financial resources needed to support an individual RNs value and work in the health system in order to mitigate burnout.

Second, this study provides the necessary groundwork to expand economic evaluations of RN burnout. Despite RNs being the largest healthcare professional group in the U.S., large-scale, national assessments of RN burnout are less prevalent in the health services literature base. This is problematic because, although health care systems perceive that burnout is an issue, there is insufficient quantitative data to understand its specific financial impact. As a result, health care organizations fail to develop and implement targeted RN burnout interventions (which may further result in hospital cost savings). Using the Markov model decision analysis structure and the POB model, the results from dissertation establish a foundation to further comprehensively assess direct RN burnout costs (see Future Studies).

Third, this study provides a framework for health system intervention on RN burnout. The POB is a concrete model that can be used by RNs, non-RN clinician groups, and health systems leaders to identify where individual or groups of RNs exist; this level of evaluation is

needed to tailor specific burnout interventions. As COVID-19 elevates the issue of clinician

burnout to the fore-front, the POB provides a blueprint for developing burnout interventions

across the spectrum of RN burnout experiences. As this dissertation demonstrates, although the

costs of RN burnout can be financially elucidated (Aim 1), RNs exist at different phases of

burnout and thus impart varying impacts to themselves, their team, patients, and the larger

system (Aim 2).

Finally, the Aim 2 study finding about an ED physical space move poses significant

implications for change in health care delivery. Given the high level of organizational transitions

that hospitals undergo on a weekly to yearly basis,[10,11] our study can inform change

implementation for improved clinician well-being. Our findings identified that change

implementation can impact RN well-being, patient care delivery, and intention to leave the

bedside. As such, change should be thoughtfully planned in a way that integrates frontline RN

perspectives so that they feel valued and so that equitable workloads are distributed across

clinician groups. These recommendations overlap with the POB findings which revealed that

RNs experience burnout when they are under-valued and experience suboptimal leadership

communication in the work environment.

Proposed Research and Future Goals

RN burnout represents a costly phenomenon to hospitals, as elucidated from this

dissertation work. Through my program of research, I aim to develop data on national RN

burnout costs. With this data, RN burnout interventions can be further evaluated from a cost-

effectiveness approach to inform health care organization decision-making. The ethnographic

results in this study (Aim 2) provide a rich structure to build a robust economic model assessing

RN burnout costs. The POB specifically represents a decision analysis structure where direct cost

inputs and probabilities can be integrated. For example, the turnover ideation decision point of "should I stay?" or "should I leave the workplace?" is represented in the Aim 1 model structure, and can be further iterated in future studies. Among RNs who "stay in the workplace", data from existing studies assessing reduced RN productivity can be used to measure the costs of "withdrawing" from work[12,13]. It is important to note that burnout is not isolated to RNs alone, but rather is an issue across all health care professionals. Thus, my program of research can be expanded to assess broad clinician burnout costs and the cost-effectiveness of burnout interventions. Such research is needed to advance health care systems that improve patient quality care at an affordable cost.

RN burnout has important implications for the diversity of the health workforce, yet this topic is minimally explored to-date. More research is needed specifically examining RN burnout drivers and experiences among RNs from historically marginalized groups (i.e., racial and ethnic minorities, LGBTQ, male RNs).[14,15] As a means to cultivate a health workforce reflective of national and global demographics, I aim to evaluate burnout experiences among these groups. Given that a key finding from this dissertation was that RN burnout experiences across the POB necessitate different interventions, RN burnout interventions may vary across RN background. This work is needed to deliver culturally concordant and equitable care to patients in hospitals.[15] Overall, this dissertation work paves a path forward for my program of research in the health services discipline.

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