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Organizational Methods of Reducing Burnout: The Impact of Self-Rostering on Work-Life-Integration

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Contents

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Executive Summary

With burnout being at an all-time high, organizations must find new ways to prioritize staff wellbeing and promote work-life balance. According to the Emergency Nurses Association (ENA) turnover in emergency departments ranges from 15-30% within the first year of nursing, and 43% within the first three years (Roncallo et al., 2020). These turnover rates cost a 300-bed facility approximately four million dollars in annual expenditure (Hesse, 2016). This level of loss and expenditure is unsustainable for the future of nursing and diverts resources away from our patients.

In recent studies, it was shown that burnout leads to difficulties for nurses in personal life and an increase in medical errors during their shifts (Boamah et al., 2016; Vidal-Blanco et al., 2019). While workload is largely driven by staffing conditions and availability of additional support services, scheduling was reported to be the most significant influence on work-life integration (Vidal-Blanco et al., 2019). Currently, the only institutional measure that has been noted to have any significant reduction in burnout is through schedule modification, specifically empowering staff to take ownership of their schedule (Min et al., 2019; Ruotsalainen et al., 2016). The literature shows that through the empowerment of staff, nurses will experience a reduction in burnout, and improve staff morale and patient care throughout the organization (Butler et al., 2019; Drach-Zahavy & Marzuq, 2012; Joyce et al., 2010; Ruotsalainen et al., 2016; Savic, 2019).

The relationships between scheduling, work-life-integration, and burn out are complex and have not been fully assessed by any groups in a dynamic quantitative manner. To assess the true impact of self-rostering on work-life-integration and burnout a long-term longitudinal study

is recommended. This paper looks to establish the basis for a longitudinal study through the utilization of a smaller population.

To assess the impact of self-rostering, new employees will repeat the Maslach Burnout Inventory (MBI) upon hire, at four weeks, and again at eight weeks. While this is an abbreviated time period which limits the ability to extrapolate significant meaning, the data generated from this short study will assist the decision for further longitudinal analysis and involvement of additional organizations to increase the study population.

While this short study was unsuccessful at establishing a relationship with statistical significance, the value of staff empowerment through self-rostering can be seen in the trends demonstrating the reduction of burnout. The inability to validate meaningful relationships can be attributed to the small sample size and the short length of study. It is therefore recommended that further review be completed to build more points of analysis for review. It is further recommended that the sampling period be extended to allow for a greater sample size more aligned with population statistics for the facility. Allowing for these two extensions, significantly increases the possibility for the establishment of statistically significant relationships among the variables of scheduling methods and the reduction of burnout through the promotion of work-life-integration.

Organizational Methods of Reducing Burnout:

The Impact of Self-Rostering on Work Life Integration

With burnout being at an all-time high, organizations must find new ways to prioritize staff wellbeing and promote work-life balance. According to the Emergency Nurses Association (ENA) turnover in emergency departments ranges from 15-30% within the first year of nursing, and 43% within the first three years (Roncallo et al., 2020). These turnover rates cost a 300-bed facility approximately four million dollars in annual expenditure (Hesse, 2016). This is an increase from an already staggering rate of turnover in which approximately one-third of emergency department nurses left the profession within their first two years of nursing (Hesse, 2016). This level of loss and expenditure is unsustainable for the future of nursing and diverts resources away from our patients. Hospitals must continually spend resources on training new nurses instead of further developing their existing staff or providing new and innovative technologies for staff to better provide patient care.

This is compounded as staffing has become increasingly complicated in our new post COVID era. Inconsistencies in scheduling can lead to difficulties in staff nurses' personal lives which increases their stress levels and impacts burnout and compassion fatigue (Boamah et al., 2016). The purpose of this paper is to evaluate the impact of consistent scheduling on the rate of burnout and compassion fatigue among new emergency department nurses.

Rationale for the Project

Nurses are well versed at handling stress, being they are highly skilled, versatile, and pride themselves on their ability to continually adapt to ever-changing circumstances. However, through the COVID 19 pandemic, we have seen record levels of burnout and turnover among acute care nurses (Aiken et al., 2023). Even prior to the COVID-19 pandemic, emergency

departments across the nation suffered from tremendous levels of stress related burnout that has resulted in the second highest turnover rate, when compared to other hospital departments and care facilities, at over 21% (Colosi, 2016). Now post COVID-19, while nursing turnover in the emergency department has dropped on average, it is still an unsustainable 20% (NSI Nursing Solutions, 2021). According to the Emergency Nurses Association (ENA) this level of turnover costs a 300-bed facility approximately four million dollars in annual expenditures (Hesse, 2016). To further compound the issue, Hesse (2016) reports that approximately one-third of emergency department nurses will resign and leave their profession within their first two years of nursing. This level of loss and expenditure is unsustainable for the future of nursing and diverts resources away from our patients. Hospitals must continually spend resources on training new nurses instead of further developing their existing staff or improving technologies for staff to better provide patient care.

In recent studies, it was shown that burnout leads to difficulties for nurses in personal life and an increase in medical errors during their shifts (Boamah et al., 2016; Vidal-Blanco et al., 2019). This is a compounding issue that leads to increased stress for the staff nurses, reducing both job satisfaction and further degradation in the level of care provided (Butler et al., 2019; Boamah et al., 2016; Joyce et al., 2010; Ruotsalainen et al., 2015). The cyclical impact of burnout is one that must be interrupted to prevent loss and mitigate risk for the health of all parties, including the organization.

Literature Synthesis

Work-Life Integration and Burnout

As reported in multiple studies, work-life integration is a key indicator when discussing burnout (Butler et al., 2019; Dyrbye et al., 2019; Vidal-Blanco et al., 2019). Improvements in work-life-integration lead to a reduction of stress, lower levels of burnout, and improvement in the quality of care delivered to patients (Butler et al., 2019; Dyrbye et al., 2019; Min et al., 2019). Among the most significant indicators for burnout was workload (Aiken et al., 2023; Martin et al., 2023). Throughout the COVID pandemic the number of nurses available to care for patients decreased and the number of patients increased, creating a significant increase in the workload reported by staff nurses (Martin et al., 2023). This increased workload and perceived lack of support from their peers and administrative teams lead to a significant increase in fatigue and burnout among nurses surveyed (Martin et al., 2023). Workload has many variables that factor into how an individual perceives their workload. Such items include, but are not limited to, nurse:patient ratio, departmental staffing, availability of support services, and scheduling practices (Vidal-Blanco et al., 2019).

While workload is driven by staffing conditions and availability of additional support services, scheduling was reported to be the most significant influence on work-life integration (Vidal-Blanco et al., 2019). This point leads to issues with many departments that have variable staffing such as the emergency department. The variable staffing models utilized by emergency departments presents several unique aspects to scheduling that leads to discord among many staff nurses. These complexities arise from needing to schedule staff around peak times in the department and the flexibility needed to properly account for the dynamic patient census. Due to these many complexities, ER managers often exert control over the schedule, causing friction

between staff nurses and administration. However, nurses report that they prefer to have power over their scheduling and dislike being at the whims of a scheduler to promote better work-life integration (Vidal-Blanco et al., 2019). Self-rostering allows nurses the ability to maximize their work-life integration, lower their internal stressors, and improves their work product (Butler et al., 2019; Joyce et al., 2010).

Scheduling to Reduce Burnout

Reducing the rate of burnout is a monumental task that must be addressed for the betterment of our patients, our staff, and our organizations. While there are many personal ways to reduce burnout and compassion fatigue, most are reliant upon staff taking a proactive role and participating in programs such as mindfulness and routine exercise (Ruotsalainen et al., 2016). Currently, the only institutional measure that has been noted to have any significant reduction in burnout is through schedule modification (Min et al., 2019; Ruotsalainen et al., 2016).

By focusing on the impact of scheduling and its relation to burnout, evidence indicates that self-scheduling empowers staff (Pryce et al., 2006, Zhang et al., 2020). The literature shows that through the empowerment of staff, nurses will experience a reduction in burnout, and improve staff morale and patient care throughout the organization (Butler et al., 2019; Drach-Zahavy & Marzuq, 2012; Joyce et al., 2010; Ruotsalainen et al., 2016; Savic, 2019).

Nurse Preferences and Values

As Vidal-Blanco et al. (2019) identify in their qualitative analysis, nurses report that scheduling is a key factor that impacts their work-life integration. They also found that many nurses prefer to have power over their scheduling and dislike being at the whims of a scheduler (Vidal-Blanco et al., 2019). Having liberty of self-scheduling decentralizes power whereas being at the whims of a central scheduler leads to increased stress for the staff nurses, reducing both

job satisfaction and the level of care provided (Ruotsalainen et al., 2015). The staff nurses that have been observed to have the least amount of stress, and also the greatest levels of job satisfaction, are those nurses who have had significant input into the scheduling (Vidal-Blanco et al., 2019). This input comes either through direct communication with their administrators in planning their schedule or through self-scheduling utilizing an open rota.

Project Stakeholders

There are many stakeholders involved in this plan. First, all changes in healthcare staffing and scheduling impact our patient population. All efforts should be made to improve the quality of healthcare being provided. That being said, as the literature establishes, as we implement strategies to look after our nurses and team members, we are working to not only improve their lives, but also the quality of care they provide. We must also not exclude our administrators and ancillary staff, because as we work to improve staffing, we also aim to reduce turnover. This in turn reduces education expenses and the workload on ancillary staff that are required to help bring new members on board.

Implementation Plan

The relationships between scheduling, work-life-integration, and burn out are complex and have not been fully assessed by any groups in a dynamic quantitative manner. To assess the true impact of self-rostering on work-life-integration and burnout a long-term longitudinal study is recommended. This pilot study will use a quantitative pretest/post-test design to establish the basis for a longitudinal study through review of a smaller population.

The facility in which this pilot study will be proposed is a one-hundred-and-forty bed acute care hospital with a level three trauma designation and is a primary heart attack center. This facility utilized a self-roster model for scheduling prior to this study. To establish a baseline

for the participants, the researchers will utilize the Maslach Burnout Inventory (MBI) General Survey to assess new employees' current level of burnout at the time of their onboarding. During their intake into the study, new employees will also answer questions as to their prior employers scheduling systems, methods, and self-report their perceived level of work-life-integration.

To assess the impact of self-rostering, new employees will repeat the MBI at four weeks and again at eight weeks. While this is an abbreviated time period which limits the ability to extrapolate significant meaning, the data generated from this short study will assist the decision for further longitudinal analysis and involvement of additional organizations to increase the study population. If sufficient relationship exists, the study will continue to further assess burnout mitigation through self-rostering with plans to benchmark with other facilities within the region.

Timetable/Flowchart

The first element necessary to complete this study was the identification of candidates for assessment. As this study seeks to review the impact of self-rostering on levels of burnout, candidates must have experience in the medical field or similar shiftwork. After collecting preliminary data from all participants and recording their baselines, it is important to attempt to identify confounding variables. As the evidence shows, there are numerous personal aspects that contribute to burnout. While it is impossible to control for so many personal factors, the researchers acknowledge that the participants selected for this study are undergoing a high stress moment in their personal lives as they are currently transitioning into new roles. The researchers also hope to further uncover additional confounding variables that may be beneficial to review for future studies.

After the baseline data is collected, two subsequent follow-ups will take place, one at four weeks and one at eight weeks. By collecting this data in succession, we hope to establish trends to and relationships across the data. The brief period and small population size of this study will not allow for data to be extrapolated to the greater population; however, the research can be used as a basis for further inquest into subject. Refer to Appendix B for a graphical flowchart of this study.

Data Collection Methods

For the purposes of this study, eligible candidates are new employees who have had at minimum one year of healthcare experience performing shiftwork. Utilizing this pool allows for the establishment of a baseline level of burnout, and a comparison to self-reported data on their perceived work-life-integration. To establish the baseline, participants will complete the Maslach Burnout Inventory (MBI) General Survey (Appendix C) at their onboarding. The MBI was first published in 1981 and has been used widely across a multitude of professions to assess burnout in a multitiered approach. It has garnered international attention due to its ability to be applied reliably with high validity in its identification of burnout.

During their intake into the study, participants will complete a demographic survey (Appendix D) to include years of experience in healthcare or shift work prior to joining the organization, and also what scheduling practices were utilized by their prior employer. By ascertaining these two key points, we hope to assess any correlation or deviation from expectations as the study progresses. Participants will be asked to complete the MBI every 4 weeks to assess progression or deterioration of status from their established baseline.

Thankfully the Maslach Burnout Inventory is rich in data and detail to help investigate relationships. The MBI consists of three separate domains, emotional exhaustion (EE),

depersonalization (DP), and personal achievement (PA). These three areas are assessed to evaluate where team members are struggling and specifically how self-rostering impacts burnout and in which categories.

Evaluation

The hypothesis for this study is that as individuals perceive greater control over their schedule through the utilization of self-rostering they will report greater levels of work-life-integration and will score lower on the MBI. The null hypothesis is that there is no relation between self-rostering and an individuals reported work-life-integration and their MBI will not be lower.

Following the completion of the data collection the data will be assessed using an array of both descriptive and analytical statistics. Descriptive statistics, population mean and median, will be utilized to assess the current population and to review for congruence of the population for potential to extrapolate data to the greater population of nurses. Further inferential statistics will be utilized to evaluate any relevant correlations between variables. To do this, a Pearson's chi square along with a statistical analysis of significance (p-value) will be assessed to determine if variables are related or if outcomes are occurring by chance.

Cost/Benefit Analysis

The costs of implementation of this plan are low within the organization being studied, with the greatest new expense being the cost of the MBI itself, as the MBI is licensed per test administered. This is because the organization had already committed to a scheduling system that empowers the staff to self-roster. Other organizations who wish to implement this strategy for themselves would need to assess the capabilities of their current human resource systems to

evaluate the capacity to self-roster. As the candidates for this study were all new employees, they were all educated to the organizations self-rostering process upon their orientation leading to no additional expense in hours for education.

The potential benefits from this intervention are poised to be significant. Prior data reporting that a 300-bed facility spends approximately four million dollars in replacing nurses due to turnover, a mere 10% reduction in turnover would save an organization of this size approximately $400,000 (Hesse, 2016). If we scale this to the organization participating, they stand to spend approximately two million dollars on educating and replacing nurses due to burnout and turnover. This means that again a mere 10% reduction in turnover would potentially save the organization $200,000 annually. These savings are far greater than the additional expense of the MBI, which can also be reduced through licensing in bulk.

Discussion of Results

At the time of authoring this paper, the data is still immature to fully assess whether or not the project is successful. This is due to the small period in which this preliminary study is being conducted. This is compounded by the small sample size that qualified for participation, only six staff members onboarded during our observation period qualified for the study. The study group as defined consisted of four females and two males. Experience ranged from one year of qualified healthcare experience to thirteen years of experience. Furthermore, the age of the candidate varied from twenty-four to forty-three years of age, with the majority of participants, three, being between twenty to thirty years old.

From studying the raw data, specific trends are visible. However due to complexities of multivariate interactions, along with the inability to differentiate due to the small sample size, we are left with descriptive statistics and anecdotal review. From this review, the data shows a trend

of decreased emotional exhaustion along with a decrease in depersonalization over the eight-week period. Furthermore, the data shows that on average respondents' personal achievement increased from 22.3 to 25.0. The standard deviation across all responses was also seen to decrease across the eight-week period. This is potentially an indicator that the new team members are assimilating into the new unit culture effectively.

Table 1: Descriptive Analysis of MBI Responses

	Initial			4-week			8-week		
	MBI-EE	MBI-DP	MBI-PA	MBI-EE	MBI-DP	MBI-PA	MBI-EE	MBI-DP	MBI-PA
Avg	26.8	17.7	22.3	25.8	17.2	23.7	24.8	16.3	25.0
Std Dev	10.8	7.3	3.4	9.1	5.9	2.3	8.7	5.4	1.8
Median	29.0	19.0	21.5	27.0	19.0	23.0	26.0	18.0	24.5

Unfortunately, our data lacks statistical significance to be extrapolated to any greater population and lacks any solid correlations between variables with no data obtaining a p-value that would allow the rejection of the null hypothesis.

Conclusions/Recommendations

Throughout the world, hospitals have struggled to retain staff through and now after the COVID-19 pandemic. This problem has been seen to be especially present in emergency departments, producing the second highest turnover rate when compared to other acute care units, one in which approximately 43% of staff nurses will vacate the profession within three years of joining it (Colosi, 2016; Roncallo et al., 2020). This is a staffing emergency, which is largely driven by burnout, compassion-fatigue, and poor work-life-integration. The evidence establishes that in order to reduce burnout organizations need to find new ways to empower staff and promote work life integration (Butler et al., 2019; Drach-Zahavy & Marzuq, 2012; Joyce et al., 2010; Ruotsalainen et al., 2016; Savic, 2019).

While this short study was unsuccessful at establishing a relationship with statistical significance, the value of staff empowerment can be seen in the trends demonstrating the

reduction of burnout. The inability to validate meaningful relationships was found to be associated to the small sample size and the short length of study. It is therefore recommended that further review be completed to build more points of analysis for review. It is further recommended that the sampling period be extended to allow for a greater sample size more aligned with population statistics for the facility. Allowing for these two extensions, significantly increases the possibility for the establishment of statistically significant relationships among the variables of scheduling methods and the reduction of burnout through the promotion of work-life-integration.

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Appendix A
Table of Evidence and Synthesis

Citation: (i.e., author(s), date of publication, & title)	CF	Design/ Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses])
Aiken, L. H. et al. (2023). Physician and Nurse Well-Being and Preferred Interventions to Address Burnout in Hospital Practice: Factors Associated with Turnover, Outcomes, and Patient Safety.	None	Cross-sectional multicenter survey 21,050 physicians and nurses at 60 nationally distributed US Magnet hospitals	n= 15,738 nurses	IV: Modifiable Work Environment DV: Clinician outcomes (burnout, job dissatisfaction, intent to leave, turnover), well-being (depression, anxiety, work-life balance, health)	Individual analysis performed with multiple variable analysis.	Descriptive analysis of data	High burnout common among nurses 47% Improving nurse staffing was ranked highest among interventions (87% of nurses) Nurse burnout was associated with higher turnover of both nurses and physicians.	Level VI Evidence Significant samples size allows for extrapolation to greater population. Significance reduced due to limited analysis of variables.
Boamah et al. (2016). Factors influencing new graduate nurse burnout development, job satisfaction and patient care quality: a time-lagged study.	None	Cohort Study: Canadian new graduate nurses Methods. Surveys 3,743 nurses 1,020 were returned (27.3% response rate)406 nurses responded (39.8% response rate).	n=406	IV: Authentic leadership DV: Structural empowerment, WLI, burnout quality of care provided	MBI-GS WIPL CWEQ-II CFA ALQ	SPSS. Modeling w/ Mplus	Authentic leadership + on structural empowerment short-staffing (-) WLI (-)	Level IV Evidence The random sampling across a national data base supports general applicability of the principles of the study which are supported by statistically significant findings.

Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Butler et al. (2019). Hospital nurse-staffing models and patient- and staff-related outcomes.	None	Systematic Review: Cochrane Central Register of Controlled Trials MEDLINE Ovid Embase Ovid; NHS Economic Evaluation Database CINAHL EBSCO Searched on 22 March 2018	n=19 studies n=3 relevant studies n=464	IV: Nurse Staffing Model DV: Nurse turnover, Departmental cost, Patient mortality	Individual analysis performed with multiple variable analysis.	CCEMG-EPPI-Centre Cost Converter GRADE system Means for cross analysis	Self-staffing improves employee outcomes and reduces nursing staff turnover.	Level I Evidence While this paper illustrates the need for further research it does establish the relationship between staffing, employee outcomes, and patient outcomes.
Drach-Zahavy et al. (2012). The weekend matters: exploring when and how nurses best recover from work stress	None	Longitudinal Panel Survey Sequential questionnaires: Prior to respite, during respite, and post respite. Participants from 2 unionized hospitals were approached and selected at random until equal representation in sample was obtained.	n=400 nurses; Alpha =0.05	IV: Work/Off weekends DV: Emotional exhaustion, and vigor	EE - MBI-GS Alpha 0.82 & 0.8 Vigor - Engagement Scale Alpha 0.76 & 0.82	4x t-test 2x hierarchical regression analyses	Having weekends off has a significant impact in the reduction of emotional exhaustion and increases vigor.	Level III Evidence This research contributes considerable evidence as to the impact of schedule on emotional exhaustion and vigor. This study provides further clarification that control over scheduling leads to improved EE and vigor.

Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Dyrbye, L. N. et al. (2019). Burnout and satisfaction with work–life integration among nurses	None	Descriptive study Sequential surveys were sent to random nurses registered with the ANA and workers to contrast levels of burnout and satisfaction with WLI.	n=8638 nurses n=5198 workers	IV: Work hours, Demographics DV: Burnout, WLI	Initial and detailed follow-up surveys. EE-MBI	Fisher exact x^2 MANOVA	Prevalence of high EE, and overall burnout increased with work hours. No significant decrease in satisfaction with WLI, however correlation between decrease WLI and increase burnout.	Level VI Evidence This descriptive study provides substantial support for the reworking of scheduling to ensure that staff are not being overworked to reduce burnout. This article further assists in establishing the connection between workload, WLI, and burnout.
Joyce et al. (2010). Flexible working conditions and their effects on employee health and wellbeing.	None	Systematic Review: Cochrane Public Health Group Specialized Register, CENTRAL; MEDLINE; EMBASE; CINAHL; PsycINFO; Social Science Citation Index; ASSIA; IBSS; Sociological Abstracts; and ABI/Inform.	n=10 studies	IV: Scheduling type (Overtime, Flextime, Self-scheduling, etc.) DV: Satisfaction, Blood pressure, Health outcomes, Family	Individual data analysis completed due to heterogeneity of data	Narrative synthesis High heterogeneity between studies.	Flextime and Self Scheduling lead to increased satisfaction and wellbeing.	Level I Evidence While this article does not provide meta-analysis, it provides a great review of evidence, and its impacts on work-life integration and health. The limitations of this study are that the data reviewed has a high level of heterogeneity reducing the ability to apply their results globally.

Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Martin, B. et al. (2023). Examining the Impact of the COVID-19 Pandemic on Burnout and Stress Among U.S. Nurses.	None	Descriptive study subset of data from the 2022 National Nursing Workforce Survey for analysis. Models were used to determine the significance of observed trends.	n=29,472 RNs	IV: Covid workload DV: Burnout	MBI	Binary logistic regression natural language processing	More than half of the sample (62%) reported an increase in their workload during the COVID-19 pandemic. Similarly high proportions reported feeling emotionally drained (50.8%), used up (56.4%), fatigued (49.7%), burned out (45.1%), or at the end of their rope (29.4%) “a few times a week” or “every day.”	Level VI Evidence Large sample size allows for extrapolation to greater population of nurses. Aids to further establish state of burnout in acute care and the significant need for further study and intervention.
Min, A et al. (2019). Work schedule characteristics and fatigue among rotating shift nurses in hospital setting: An integrative review	None	Systematic Review: CINAHL, PubMed, EMBASE, PsycINFO, SCOPUS, and Web of Science Articles published between 2000-2018	n=8 studies	IV: Work schedule characteristics DV: Level of fatigue	Individual analysis performed with multiple variable analysis.	Swedish Occupational Fatigue Inventory Fatigue-Related Symptoms Questionnaire Fatigue Questionnaire Chalder Fatigue Scale	Inconsistent data exists pertaining to the impact of schedule characteristics and fatigue. Shift length, quick turn arounds, and reduced rest time were associated with higher levels of fatigue.	Level I Evidence Due to individual aspects noted in the study, there is high variability in impact of schedule characteristics on fatigue. This provides supporting evidence for the need to empower staff in allowing them control individual scheduling to ensure that they have sufficient recovery time in between shifts.

Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Pryce et al. (2006). Evaluation of an open-rota system in a Danish psychiatric hospital: a mechanism for improving job satisfaction and work-life balance.	None	RCT Intervention was implemented on multiple units within a hospital. Applicability may be limited due to the intervention only being implemented within a single hospital system.	n=177	IV: Implementation of an open-rota scheduling system vs standard scheduling DV: Job satisfaction	Questionnaire 3 indices Work-Scheduling Work-Life Health and Well-being	MANOVA Wilk's Lambda	Self-scheduling using open-rota improved job satisfaction, & work-life integration	Level II Evidence Limitations involved with this article are the lack of blind trials and the study implementing the intervention at a single hospital. Further analysis needs to be done to thoroughly evaluate whether this intervention has global application.
Ruotsalainen et al. (2015). Preventing occupational stress in healthcare workers.	None	Systematic Review: Cochrane Central Register of Controlled Trials MEDLINE/PubMed EMBASE.COM PsycINFO/ProQuest CINAHL/EBSCO NIOSHTIC-2 Web of Science	n=58 studies n=7,188	IV: Cognitive Behavioral Interventions IV: Mental and Physical Interventions IV: Organizational Interventions DV: Burnout and Stress	Individual analysis performed with multiple variable analysis.	SMDs for cross analysis Meta-analysis. GRADE system	Scheduling was the only organizational intervention that showed statistically significant evidence of reducing stress.	Level I Evidence This article provides a great review of evidence, and its impacts on stress reduction. The limitations of this study are that the majority of the data reviewed is that of low-quality research and concludes that more research needs to be conducted. Further evidence is needed to assess the impact of scheduling upon burnout and compassion fatigue.

Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Savic et al. (2019). How Do Nurses Cope with Shift Work? A Qualitative Analysis of Open-Ended Responses from a Survey of Nurses.	Open-ended Survey	Qualitative: Open-ended survey Participants from a metropolitan healthcare agency in Melbourne, AU consisting of 3 major hospitals and multiple clinics.	n=449	IV: Method of coping DV: Relative level of burnout and fatigue	Open-ended survey	Framework approach to thematic analysis	Self-staffing promotes successful coping with shift work and reduces medical errors.	Level VI Evidence This research has a significant sample size for a qualitative study. This study further illustrates the significant impact of self-scheduling to reduce burnout and fatigue.
Vidal-Blanco et al. (2019). Quality of work life and self-care in nursing staff with high emotional demand.	Structured Interviews	Qualitative: Constructivist Paradigm Semi-structured interviews. Interviews included professionals from the Valencian healthcare system, with typical profiles of nurses working in surgical units, emergencies, oncology, home care, and cooperation.	n=8	IV: Utilization of self-care DV: Quality of work-life integration.	Transcribed content	Content analysis and analysis with Maxqda11 were utilized.	Poor quality of work-life integration and compassion fatigue are a result of stress overload circumstances	Level VI Evidence The small sample size is the largest limiting factor as to answer the overall research questions. The conclusions reached by the researcher are valid as they are not overreaching and general in nature

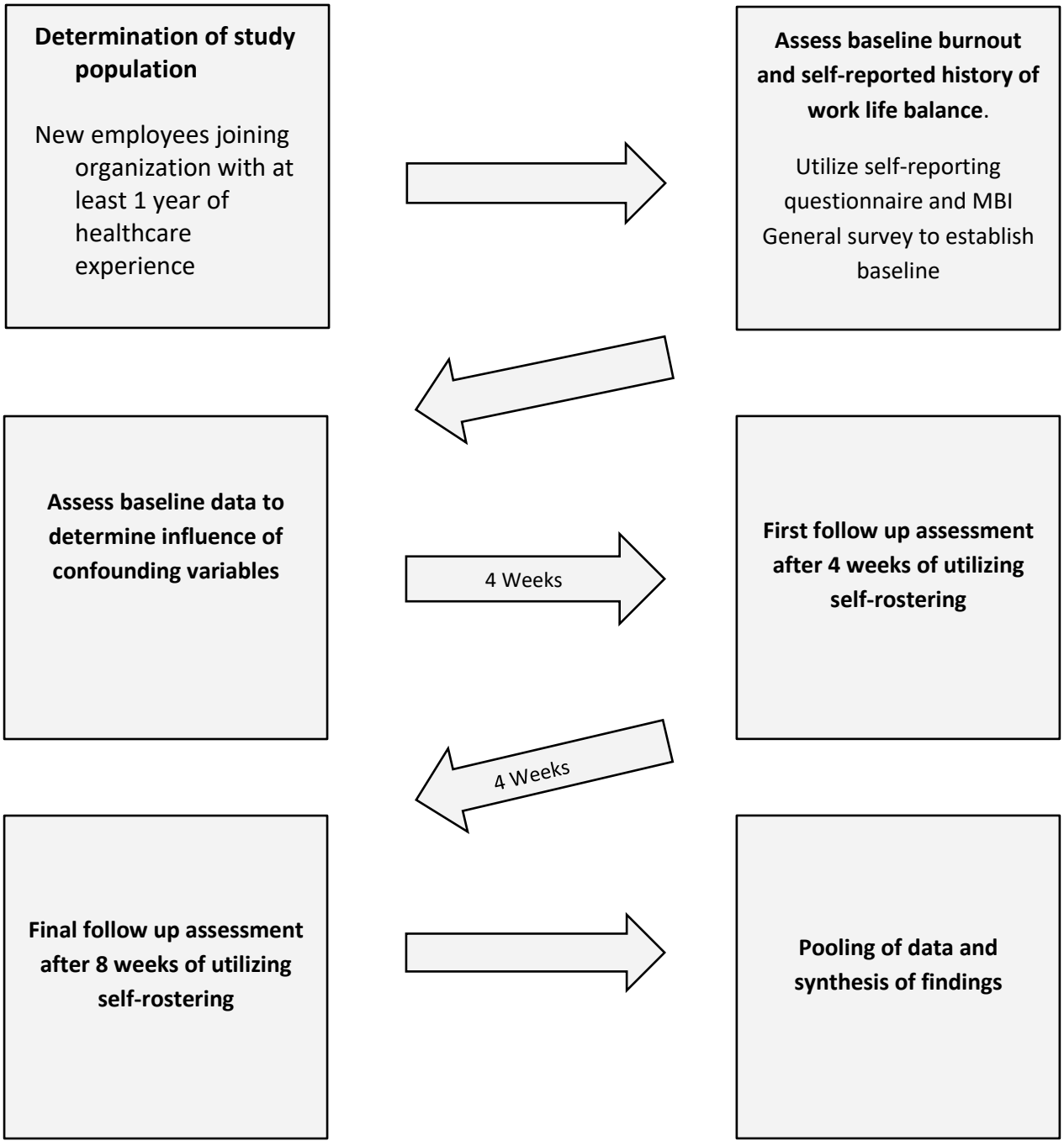
Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Zhang, X. J. et al. (2020). Interventions to reduce burnout of physicians and nurses: An overview of systematic reviews and meta-analyses	None	Meta-analysis: Cochrane Library, PubMed, Ovid, Scopus, EBSCO, and CINAHL Articles published between 2014-2019	n=22 studies n=6 Nursing n=7 All Providers n=9 Doctors	IV: Organizational Interventions DV: Reduction of Burnout	Individual data extraction MBI, JSS, PSS, ESS, BP and HR	Quantitative Synthesis AMSTAR 2, ROBIS	Bundled packages including workload, resiliency coaching, and mindfulness had the greatest impact on reducing stress.	Level I Evidence This article compiles and summarizes significant research regarding organizational attempts to reduce burnout. While this article highlights the need for further research, it provides the recommendation of bundling stress reduction techniques.

Legend: n=sample size, IV=independent variable, DV=dependent variable, RCT= Randomized Controlled Trial

Appendix B

Pilot Study Flowchart



Appendix C

Burnout Self-Test
Maslach Burnout Inventory (MBI)

The Maslach Burnout Inventory (MBI) is the most commonly used tool to self-assess whether you might be at risk of burnout. To determine the risk of burnout, the MBI explores three components: exhaustion, depersonalization and personal achievement. While this tool may be useful, it must not be used as a scientific diagnostic technique, regardless of the results. The objective is simply to make you aware that anyone may be at risk of burnout.

For each question, indicate the score that corresponds to your response. Add up your score for each section and compare your results with the scoring results interpretation at the bottom of this document.

Questions	**Never**	**A few times per year**	**Once a month**	**A few times per month**	**Once a week**	**A few times per week**	**Every day**
SECTION A	**0**	**1**	**2**	**3**	**4**	**5**	**6**
I feel emotionally drained by my work.							
Working with people all day long requires a great deal of effort.							
I feel like my work is breaking me down.							
I feel frustrated by my work.							
I feel I work too hard at my job.							
It stresses me too much to work in direct contact with people.							
I feel like I'm at the end of my rope.							
Total score – SECTION A							

Questions	**Never**	**A few times per year**	**Once a month**	**A few times per month**	**Once a week**	**A few times per week**	**Every day**
SECTION B	**0**	**1**	**2**	**3**	**4**	**5**	**6**
I feel I look after certain patients/clients impersonally, as if they are objects.							
I feel tired when I get up in the morning and have to face another day at work.							
I have the impression that my patients/clients make me responsible for some of their problems.							
I am at the end of my patience at the end of my work day.							
I really don't care about what happens to some of my patients/clients.							
I have become more insensitive to people since I've been working.							
I'm afraid that this job is making me uncaring.							
Total score – SECTION B							

Questions	Never	A few times per year	Once a month	A few times per month	Once a week	A few times per week	Every day
SECTION C	**0**	**1**	**2**	**3**	**4**	**5**	**6**
I accomplish many worthwhile things in this job.							
I feel full of energy.							
I am easily able to understand what my patients/clients feel.							
I look after my patients'/clients' problems very effectively.							
In my work, I handle emotional problems very calmly.							
Through my work, I feel that I have a positive influence on people.							
I am easily able to create a relaxed atmosphere with my patients/clients.							
I feel refreshed when I have been close to my patients/clients at work.							
Total score – SECTION C							

SCORING RESULTS - INTERPRETATION

Section A: Burnout

Burnout (or depressive anxiety syndrome): Testifies to fatigue at the very idea of work, chronic fatigue, trouble sleeping, physical problems. For the MBI, as well as for most authors, "exhaustion would be the key component of the syndrome." Unlike depression, the problems disappear outside work.

- Total 17 or less: Low-level burnout
- Total between 18 and 29 inclusive: Moderate burnout
- Total over 30: High-level burnout

Section B: Depersonalization

"Depersonalization" (or loss of empathy): Rather a "dehumanization" in interpersonal relations. The notion of detachment is excessive, leading to cynicism with negative attitudes with regard to patients or colleagues, feeling of guilt, avoidance of social contacts and withdrawing into oneself. The professional blocks the empathy he can show to his patients and/or colleagues.

- Total 5 or less: Low-level burnout
- Total between 6 and 11 inclusive: Moderate burnout
- Total of 12 and greater: High-level burnout

Section C: Personal Achievement

The reduction of personal achievement: The individual assesses himself negatively, feels he is unable to move the situation forward. This component represents the demotivating effects of a difficult, repetitive situation leading to failure despite efforts. The person begins to doubt his genuine abilities to accomplish things. This aspect is a consequence of the first two.

- Total 33 or less: High-level burnout
- Total between 34 and 39 inclusive: Moderate burnout
- Total greater than 40: Low-level burnout

A high score in the first two sections and a low score in the last section may indicate burnout.

Appendix D

Participant Registration – Organizational Impact on Burnout

Name:

Gender:

Age:

a. 20-25 b. 25-30 c. 30-35 d. 35-40 e. 40-45 f. 45-50 g. 50-55 h. 55+

Years of Experience (Nursing, Healthcare, Related Shift Work):

Prior Scheduling Method:

a. Matrix b. Central Scheduler c. Block Schedule d. Self-Roster e. Other _____

Data collected electronically via forms submitted through organizational intranet.