UNIT-HOUR-UTILIZATION IMPACT ON EMS PROVIDER SATISFACTION

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by

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Abstract

The VBRescue system is facing a multifaceted challenge in the form of declining volunteerism, which has resulted in a higher workload, demanding shifts, and elevated unit hour utilization (UHU) rates. This study investigates the relationship between UHU rates and EMS provider satisfaction and how external factors influence these metrics. The research method included interviews, surveys, and UHU data review to explore the life experiences of EMS providers. The study aimed to answer the following questions: What proportion of EMS providers express satisfaction with their shifts relative to UHU rates? What external factors influence EMS provider satisfaction during shifts beyond UHU rates? What constitutes an optimal UHU rate to foster a contented EMS workforce?

The study found a positive correlation between workload (UHU) and satisfaction initially, but a critical threshold is reached around 60% UHU, beyond which workload becomes a concern, especially for experienced providers. Interestingly, newer providers exhibited higher satisfaction with increased UHU levels. External factors, such as call volume, patient acuity, crew dynamics, and logistics, impacted EMS provider experiences. Patient acuity emerged as a key factor influencing provider satisfaction.

The study recommends a shift from focusing solely on UHU rates to a multidimensional dashboard that incorporates call acuity, out-of-service activities, travel times, crew composition, and provider feedback. Such an approach can foster a better work environment for EMS professionals. The findings of the study provide a roadmap to address the challenges and improve EMS provider satisfaction, which is critical for maintaining the quality of patient care.

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Contents

CHAPTER 1. INTRODUCTION

Volunteer Emergency Medical Services (EMS) providers play a vital role in the delivery of prehospital care, constituting approximately 22% of the overall EMS workforce in the United States (U.S. Bureau of Labor Statistics, 2021). However, in recent years, the Virginia Beach Emergency Medical Services (VBRescue) system has witnessed a significant decline in volunteer EMS provider retention, with a 23.7% decline in volunteer active Attendant-In-Charge (AIC) EMS providers over the past six years (VBRescue monthly membership reports, personal communication, 2023). This concerning trend is compounded by feedback from VBRescue exit surveys and satisfaction assessments, which consistently indicate a prevailing sentiment among providers that each shift is excessively busy, compounded by perceived burdens of excessive duty shift (hours) requirements (VBRescue 2023 exit survey report, personal communication, 2023).

Additionally, the UHU rate for the VBResuce system has surged by 41.8%, reaching a peak of 94.2 % during specific hours of the day during the middle of the week (VBEMS Operations Dashboard Database, personal communication, 2023). This trend necessitates a comprehensive examination, impacting operational efficiency and, more importantly, the well-being of volunteer EMS providers. The VBRescue system's status is not unique, as the trend is being observed nationwide. According to a study conducted by Melnyk et al. (2023) published in the *Journal of Environmental Research and Public Health* in 2022, there has been a 15% decline in the number of EMS volunteers in the United States between 2020 and 2022. This decrease is attributed to several factors, including the ongoing COVID-19 pandemic, burnout among volunteers, and increased family demands. Overall, volunteer EMS providers are facing numerous challenges, including changing demographics, workforce shortages, difficulties in

recruiting and retaining volunteers, and demanding training and certification requirements. These challenges make it hard to attract and keep qualified personnel. Strategies to address these issues should focus on improving compensation, offering career development opportunities, implementing flexible scheduling, and creating supportive work environments (Cash et al., 2021).

In light of these challenges, understanding and addressing the specific concerns of volunteer EMS providers at the local level is exemplified and imperative for VBRescue. One method of accomplishing these goals is researching whether optimizing UHU can enhance provider morale, bolster the volunteer EMS provider retention rate, and efficiently and effectively provide quality EMS service. The aim of the quantitative study is to analyze the UHU rates, external factors effecting shift satisfaction, and when EMS provider experience job satisfaction relates UHU within the VBRescue system. The study will investigate three main questions related to volunteer satisfaction. Firstly, what percentage of EMS providers are satisfied with their shifts based on the UHU rate for both volunteers and career workers? Secondly, what external factors affect EMS personnel satisfaction during a shift that are not captured by UHU rates? Lastly, what is the ideal rate of UHU for ambulances to maintain a satisfied EMS workforce?

The findings of this qualitative study will hopefully have implications for the VBRescue system and volunteer EMS providers nationwide. By identifying the optimal UHU rate for ambulances and understanding the relationship between UHU rates and EMS provider satisfaction, this study will provide valuable insights for improving operational efficiency, bolstering provider retention, and enhancing the quality of EMS care delivered to the City of Virginia Beach.

Background

VBRescue is a prominent organization known for its collaborative efforts between dedicated volunteers and skilled career professionals. With a mission to provide exceptional pre-hospital patient care, cutting-edge education, and efficient rescue services, VBRescue is one of the nation's largest and most comprehensive EMS systems. Comprising various integral components, including the Virginia Beach Department of EMS, 10 distinct volunteer rescue squads, the Marine Rescue Team, and lifeguard services, VBRescue ensures a multifaceted response to emergencies and disasters, with a dynamic team of over 1,000 passionate volunteer EMS members and 165 EMS career members. The VBRescue system collaborates with the emergency response network of the City of Virginia Beach, which includes the Virginia Beach Fire Department (VBFD) and the Virginia Beach Police Department (VBPD). The VBFD plays a crucial role in EMS response by offering ALS first response to 65% of the EMS responses within the city.

However, recent trends indicate a concerning decline in the number of volunteer active AIC EMS providers within the VBRescue System, experiencing a 23.77% decrease over the last six years (VBRescue monthly membership reports, personal communication, 2023). This decline is attributed to volunteers reporting excessively busy shifts and demanding duty shift hours. Additionally, the VBRescue system has witnessed a significant 41.88% increase in UHU, with some hours reaching a nearly 94.2 % UHU rate (VBEMS Operations Dashboard, personal communication, 2023). Real-life accounts from volunteer EMS providers exemplify this increased workload, where one resigned, citing physical challenges and the need for retirement due to the strenuous nature of the shifts. Another expressed concerns about the inflexibility of the

scheduling, particularly the 12-hour shifts that interfered with personal commitments and family time (VBRescue 2023 exit survey report, personal communication, 2023).

These trends highlight the need for a comprehensive examination of the challenges faced by the VBRescue System, particularly in retaining volunteer EMS providers. Understanding the factors contributing to the decline and addressing issues related to workload and scheduling is crucial to ensuring the sustained effectiveness of this vital EMS system in Virginia Beach.

The challenges EMS agencies face are not unique to VBRescue but are part of a broader issue across the United States. A 2023 EMS trend survey found that 97% of EMS agencies reported staff turnover as a significant challenge (Hatt, 2023, p. 10). These challenges highlight the need for effective solutions to address staffing challenges and improve the EMS workforce. This is reinforced by the Center for Public Safety Excellence & International City/County Management Association (2020) 21st Century Fire and Emergency Services white paper, which aims to spur dialogue and motivate local government to prepare for anticipated changes in the industry. It highlights the need for organizations to act today to address critical issues and develop the necessary bandwidth to resolve them. The committee emphasizes the importance of sustainability and community-wide impact in the rapidly changing environment.

Despite these challenges, the EMS workforce also presents several opportunities for improvement. One critical opportunity is for EMS agencies to transform their mindset and culture to leverage data for effective decision-making. This includes utilizing quality data for evidence-based decision-making, implementing advanced data analytics, developing comprehensive records management systems, and focusing on outcome-based data for all. Specific strategies include educating personnel on data capture, updating the National Fire

Incident Reporting System (NFIRS), leveraging technology, tracking exposure, and establishing best data cleansing and access practices.

EMS personnel work long hours that include responding to emergency calls, equipment maintenance, training, and paperwork. The number of hours they spend on these work-related activities, known as the UHU, can have a significant impact on their job satisfaction and overall well-being. Research has shown that high UHU rates can lead to increased turnover and decreased job satisfaction among EMS personnel (O'Connor, et al., 2021). While emergency calls for service contribute significantly to UHU, non-emergency activities can also cause fatigue. Therefore, the researcher must use other measures, such as fatigue surveys, in conjunction with UHU to get a complete picture of how EMS personnel are doing. In conclusion, UHU is a useful tool for understanding the workload of EMS personnel, but the researcher must consider other factors essential to consider other factors that contribute to their fatigue.

To achieve a people-centered EMS system, agencies must have a deep understanding of the challenges facing the EMS workforce and the opportunities available to create a more efficient and effective system (National Highway Traffic Safety Administration, 2019). By adopting a comprehensive approach, they can design and implement processes, protocols, technology, policies, and practices that meet the unique needs of stakeholders. Through this approach, agencies can ensure that they provide the best possible outcome for individuals and communities.

Significance of the Study

The significance of the study will hopefully address four out of the eight forces that are predicted to impact EMS and Fire departments in the future, as identified by the Center for Public Safety Excellence & International City/County Management Association's (2020) 21st

Century Fire and Emergency Services white paper. By analyzing why volunteerism with VBRescue has decreased because of increased UHU rates through the use of robust data, this study will help to identify the culture of the VBRescue system, its sustainability challenges, health and wellness of its providers, and the impact it has on the department's identity and profession as an industry (VBRescue 2023 exit survey report, personal communication, 2023).

The decline in volunteer EMS providers has several economic, political, cultural, and historical implications. Economically, it can lead to increased costs for cities and localities due to the need for increased career staffing. Politically, it can reduce retention and recruitment efforts due to the perception of career EMS taking over volunteers. Culturally, it can have a negative impact on community morale and social cohesion due to the important role of volunteer EMS providers in building relationships with community members and promoting community safety. Historically, it could represent a shift away from the traditional model of EMS delivery in the United States. Overall, the decline in volunteer EMS providers is a complex issue with far-reaching implications that must be considered when developing solutions to address the shortage of EMS providers.

This research aims to investigate the impact of UHU and increased call volume on EMS provider retention, identify the specific career stages and age groups where these challenges become more significant, and explore the role of the provider's age in relation to the business of the EMS system. The findings of this research will inform the development of targeted retention strategies to enhance the effectiveness of VBRescue and other EMS organizations nationwide. By addressing the root causes of volunteer attrition, this research has the potential to mitigate the negative economic, political, cultural, and historical implications of this trend.

The decline in volunteer EMS providers has several other potential implications, including increased response times, increased stress on career staff, and reduced community engagement. With fewer volunteers available, career staff may be required to work longer hours and take on more responsibilities to compensate for the shortage of volunteers, which could lead to burnout, job dissatisfaction, and possibly adverse patient outcomes. Finally, volunteer EMS providers often play an important role in community outreach and education programs, so a decline in volunteerism could lead to reduced community engagement in EMS and public health initiatives.

Volunteer EMS providers are facing numerous challenges, including changing demographics, workforce shortages, difficulties in recruiting and retaining volunteers, and demanding training and certification requirements. These challenges make it hard to attract and keep qualified personnel. Strategies to address these issues should focus on improving compensation, offering career development opportunities, implementing flexible scheduling, and creating supportive work environments (Cash et al., 2021). This study will focus on the need for a supportive work environment and flexible scheduling as it relates to UHU rates.

In conclusion, this research hopes to provide valuable insights into the factors contributing to the decline in volunteer EMS provider retention and the far-reaching implications of this trend. By understanding the impact of UHU and increased call volume on EMS provider satisfaction, external factors affecting the EMS shift, and the past as it relates to the comparison of UHU rates and retention rates, this research will help in developing targeted retention strategies to enhance the effectiveness of VBRescue and other EMS organizations nationwide. Addressing the root causes of volunteer attrition can mitigate the negative economic, political, cultural, and historical implications of this trend, ensuring the continued viability of volunteer

EMS services and their vital contributions to public safety, community engagement, and the long-term sustainability of EMS systems.

Problem Statement

The problem is the increasing prevalence of decreasing volunteerism within the VBRescue system poses a significant threat to the health and well-being of the current EMS providers. It also increases the burden on city resources. This trend is compounded by feedback indicating excessive workload, demanding duty shift requirements, and a surge in UHU rates (VBEMS Operations Dashboard Database, personal communication, 2023; VBRescue 2023 exit survey report, personal communication, 2023). High UHU rates are a key factor contributing to provider burnout and dissatisfaction. Research has shown that high UHU rates can lead to increased turnover and decreased job satisfaction among EMS personnel (O'Connor et al., 2021). This trend, coupled with the emergence of distressed work, creates a vicious cycle that disincentivizes new entrants while simultaneously prompting experienced providers to exit the field (Melnyk et al., 2023).

Ultimately, measuring UHU is a balancing act between system efficiency and provider safety and satisfaction. EMS agencies responding solely to 911 calls typically target a lower unit hour utilization (between 0.30 and 0.50 UHU) to ensure enough units are available for emergencies (Fitch, 2015). It's important to note that UHU does not account for productivity outside of emergency responses, like paperwork and training. Therefore, the key question is the following: What is the balance between EMS provider satisfaction and safety versus agency efficiency and economic responsibility?

This situation requires a qualitative research approach to investigate the relationship between UHU and key metrics. These metrics include the EMS provider satisfaction rate, which

is the percentage of VBRescue providers who are satisfied with a shift experience as it relates to morale. Additionally, provider morale will be evaluated to determine if there are external factors that affect morale that are not captured by UHU rates. Lastly, UHU will be measured to determine the number of hours per unit per day spent on work-related activities. This inquiry will provide valuable insights into the correlation between these metrics and UHU. By examining these metrics and their interactions, this research aims to determine whether optimizing UHU can positively impact provider morale and retention, ultimately leading to a more efficient and sustainable EMS service within the VBRescue system.

Purpose Statement

The purpose of the research project mentioned above is to explore the possibility of optimizing UHU to trigger an improvement in provider morale, volunteer EMS retention rates, and the delivery of high-quality EMS services. To achieve this goal, the study will employ a qualitative approach to analyze how UHU rates the impacts of providers' job satisfaction within the VBRescue System. In addition to this, the researchers will also conduct interviews and surveys with EMS providers to gain valuable insights into their experiences and perspectives. By doing so, the study aims to provide a more comprehensive understanding of the factors that contribute to the success of EMS services and how they can be improved through the effective utilization of UHU.

Research Questions

This researcher aims to explore the difficulties of retaining volunteer EMS providers in the VBRescue System as it relates to UHU rates and the strategies that can be implemented to address these issues and enhance retention. To achieve this, a qualitative approach will be utilized, which involves analyzing UHU rates along with retention data, as well as conducting

surveys and interviews with volunteer EMS providers. The outcomes of this study will have significant implications for the VBRescue System and other EMS systems that are grappling with similar challenges.

The research aims to investigate three main questions about volunteer EMS providers' satisfaction in the VBRescue system:

RQ.1. What percentage of EMS providers are satisfied with their shifts based on the UHU rate for both volunteers and career workers?

RQ.2. What external factors affect EMS personnel satisfaction during a shift that is not captured by UHU rates?

RQ.3. What is the ideal rate of UHU for ambulances to maintain a satisfied EMS workforce?

Summary

EMS systems across the country are facing a significant challenge due to a decline in volunteer provider retention. This study specifically focuses on the VBRescue system, which has experienced a 23.7% drop in volunteer active AIC EMS providers over the last six (VBRescue monthly membership reports, personal communication, 2023). Furthermore, the Unit-Hour-Utilization rate has increased by 41.8%, peaking at 94.2% during certain periods of the day. The primary objective of this study is to determine if optimizing UHU rates can enhance provider morale, boost EMS provider shift satisfaction rates, and deliver quality EMS service efficiently and effectively. The study will utilize a quantitative approach to analyze UHU rates and shift satisfaction data. Additionally, surveys and interviews with EMS providers will be conducted to explore key metrics, such as EMS member satisfaction and external factors that have no relation to UHU. The study's research questions include determining the satisfaction rate for EMS providers in the VBRescue system, identifying external factors that influence provider

satisfaction, and establishing the optimal UHU rate for ambulances to enhance EMS provider satisfaction while ensuring efficiency and effectiveness in delivering EMS care to the City of Virginia Beach.

CHAPTER 2: LITERATURE REVIEW

Introduction

This literature review examines the existing research on the relationship between call volume and provider satisfaction, specifically in relation to burnout. The review explores the concept of using UHU as a measure of EMS performance and its limitations. It delves into the impacts of high employee utilization rates on healthcare and EMS personnel, including increased turnover, decreased job satisfaction, provider fatigue, medical errors, and burnout. The review also provides insights into the current state of the EMS workforce, including demographics and motivation levels. Additionally, the review examines the challenges of burnout and retention within other healthcare fields, highlighting key factors influencing departure and potential strategies for improvement. Finally, the review explores the concept of coarseness in the EMS workplace and its negative impact on workforce morale and retention.

The existing literature highlights that EMS play a crucial role in providing critical care in life-threatening situations. However, measuring and optimizing ambulance utilization is a significant challenge for the industry. Many studies have established a link between call volume, provider satisfaction, and burnout. However, only a few studies have evaluated the ideal call volume required to impact provider satisfaction positively.

Existing Literature

The workforce of the VBRescue system is quite similar to that of the national EMS. Most EMS professionals work full-time and provide 9-1-1 services, and they usually have three to

seven years of experience (Rivard et al., 2019). Moreover, about 13% of EMS workers across the country volunteer as their primary job, while an additional 10% do so while holding a paid position elsewhere (Cash et al., 2020).

Retaining EMS personnel is a major challenge in the industry. According to Hatt's (2023) survey, 97% of agencies struggle with significant staff turnover. A study from 2020 that compared volunteer and paid EMS professionals highlighted the high costs associated with replacing experienced professionals, including recruitment, selection, training, and lost productivity (Cash et al., 2020). In cross-sectional research conducted by Cash et al. (2017), an attrition rate of 4% was found among nationally certified EMS professionals, with most intending to return to the field. However, the study identified several key factors that influence departure, such as the need for better pay and benefits and the desire to pursue further education. Stakeholders must prioritize addressing these factors through targeted strategies to improve recruitment and retention within the EMS workforce. Other variables that contribute to increased burnout include paramedic certification, longer experience, and higher call volume. This high burnout rate is leading to decreased workforce satisfaction and retention, ultimately discouraging new entrants from joining the field (Melnyk et al., 2023).

Employee Burnout

While the factors discussed so far paint a complex picture of the challenges faced by EMS personnel, they also point toward potential solutions. Addressing workplace roughness, fostering opportunities for compassion and service, and improving compensation and the overall work environment emerge as key areas for action for a more sustainable and fulfilling experience for EMS professionals. EMS personnel face a unique and challenging work environment, often encountering negative interpersonal behaviors known as incivility. Research by Cash et al.

(2017) highlights the link between incivility and workforce-reducing factors, such as stress, job dissatisfaction, and turnover intentions. Their findings indicate that nearly half of respondents experienced incivility at least once a week, with higher levels associated with increased stress and turnover intentions. Additionally, Blau and Chapman (2016) found EMT-basics reporting higher job satisfaction compared to paramedics, suggesting potential role-specific challenges. While the sense of duty and self-sacrifice inherent in the job can motivate EMS professionals, Stefurak et al. (2020) suggest limited opportunities for concrete acts of compassion and service may negatively impact satisfaction. Furthermore, the desire for better pay and benefits, coupled with burnout, are significant drivers of turnover intentions (Blau & Chapman, 2016; Crowe et al., 2017). These findings suggest addressing workplace incivility, creating opportunities for compassion and service, and improving compensation and work environment as key strategies to improve job satisfaction and retain EMS professionals.

According to Gunaydin et al. (2022), leadership must find ways to lower burnout levels in healthcare workers to prevent negative consequences for both the workers and their patients. The healthcare sector is witnessing an alarming rise in burnout levels among its workforce, due to the challenging and often unpleasant working conditions (Crowe et al., 2017). Chronic job stress has been acknowledged as a legitimate issue and has now been officially classified as burnout in the International Classification of Diseases Revision 11 (DePorre et al., 2023). This syndrome is characterized by emotional exhaustion, cynicism, and reduced professional efficacy (National Academies of Sciences, Engineering, and Medicine, 2019). Despite the significant resources dedicated to fighting physician burnout over the last two decades, Dr. DePorre (2023) points out that there is still limited effect on it, creating a paradox. Therefore, the healthcare industry must radically change its approach to employee burnout.

Burnout is a condition that can occur due to exhaustion, which is one of its dimensions. Whether or not burnout occurs depends on an individual's ability to overcome difficult situations. In this context, the presence of hope has been found to have a significant negative impact on burnout, while self-worth does not affect it. A study conducted by Alif et al. in 2023 concluded that hope has a greater impact on burnout than self-worth. However, the challenge lies in implementing this knowledge in practical strategies. Understanding how emotional exhaustion varies throughout the workday and in response to different factors can be valuable for individuals and organizations in determining the best time and arrangement of job requirements. For instance, scheduling challenging tasks early in the day may be more beneficial, as employee emotional exhaustion tends to be lower during that time (Lee et al., 2023).

Unit-Hour-Utilization

Understanding the specific challenges faced by EMS personnel is crucial for developing targeted interventions and ensuring the continued delivery of life-saving care within this vital system. UHU is a critical metric in EMS for assessing ambulance utilization that may be utilized to balance the ideal work volume. However, there is no single standard for calculating UHU, leading to inconsistencies in its interpretation. Two common methods exist: dividing staffed ambulance hours by the amount of time committed to a response and dividing staffed ambulance hours by the number of transports (Academy of International Mobile Healthcare Integration, 2023; Fitch, 2015). Both methods have limitations as they fail to capture aspects of ambulance utilization, such as time spent on non-transport calls and internal activities like documentation and training. This lack of consensus and incomplete picture limits the effectiveness of UHU as a standard measure of EMS performance and productivity.

The optimal UHU ratio for EMS agencies remains a topic of debate, with no single ideal figure emerging. This lack of consensus stems from the diverse nature of EMS operations, with agencies responding solely to 911 calls aiming for lower UHU ratios (0.30 to 0.50) to ensure adequate emergency response capacity. Additionally, agencies with longer shifts, such as 24-hour operations, often target lower UHU ratios to mitigate provider fatigue and safety concerns (Fitch, 2015). While national data indicates an average Response UHU rate of 0.594 for high-performing EMS systems, the median ambulance response time for high-acuity calls in these agencies remains at a respectable eight minutes and 41 seconds (Academy of International Mobile Healthcare Integration, 2023). Thus, the ideal UHU ratio for each agency ultimately depends on its specific needs and priorities, requiring careful consideration of factors like call volume, response times, and staff well-being.

Several studies have investigated the effects of high UHU rates on EMS personnel. Research has shown that high UHU rates can lead to increased turnover and decreased job satisfaction among EMS personnel (O'Connor et al., 2022). Increased utilization of units can lead to provider fatigue and medical errors, particularly in EMS systems that require 24-hour shifts (Fitch, 2015). Work-related burnout has been found to be associated with the number of weekly calls handled by an individual. The likelihood of work-related burnout is highest among those who respond to 20 or more calls per week, compared to those who handle fewer than five calls (Crowe et al., 2017). Those who responded to 20 or more calls per shift had nearly two-and-one-half-times the odds of patient-related burnout as those who responded to fewer than five calls per week (Crowe et al., 2017). These findings suggest that high UHU rates can have a negative impact on EMS personnel, leading to increased turnover, decreased job satisfaction, provider

fatigue, medical errors, and burnout. While the negative effects of high UHU rates on EMS personnel are concerning, they are by no means an isolated phenomenon.

Synthesis of the Existing Literature

The VBResuce system presents a unique and often challenging landscape for its dedicated personnel. While sharing similarities with the national EMS workforce in terms of full-time schedules and experience levels, a significant portion (13%) also volunteer their expertise, highlighting the deep commitment within the field (Cash et al., 2020). However, this dedication is met with a harsh reality: EMS faces a critical challenge in retaining its workforce. A survey conducted in 2023 revealed a staggering 97% of agencies struggling with significant staff turnover, highlighting the need for immediate action (Hatt, 2023 p. 10). The high costs associated with replacing experienced professionals add another layer of urgency to this issue.

Research identifies several key factors contributing to this departure. Workplace coarseness, coupled with limited opportunities for expressing compassion and service, takes a significant toll on morale and satisfaction. Furthermore, inadequate rewards or compensation and benefits, along with demanding workloads and long hours, can culminate in worker burnout.

By fostering a culture of civility and respect, EMS agencies can create a more supportive and positive work environment (Cash et al., 2017). Encouraging acts of compassion and service can reignite passion and purpose, while addressing concerns about pay and benefits can demonstrate a commitment to the well-being of the team. Optimizing scheduling and workload distribution can further mitigate the physical and emotional strain on EMS personnel.

Scheduling and workload optimization pose significant challenges, and UHU metrics can help measure these aspects. However, the lack of industry studies to determine the ideal UHU rate and the inconsistent measurement techniques across various systems hinder the effective use

of these metrics. Therefore, further research is needed to establish industry standards and best practices for measuring UHU rates. This will enable organizations to optimize their scheduling and workload management processes, leading to improved productivity and operational efficiency.

Creating a work environment that is sustainable and fulfilling for EMS personnel is not just about increasing retention and daily satisfaction rates. It is about guaranteeing that life-saving care is continuously delivered to those who need it. By comprehending the challenges that this important workforce faces and implementing focused interventions, it is important to that they have the necessary resources and support to thrive and continue serving communities in a crucial way.

Summary

EMS systems across the country are facing a significant challenge due to a decline in volunteer provider retention. This study specifically focuses on the VBRescue system, which has experienced a 23.7% drop in volunteer active AIC EMS providers over the last six years (VBRescue monthly membership reports, personal communication, 2023). Furthermore, the Unit-Hour-Utilization rate has increased by 41.8%, peaking at 94.2% during certain periods of the day. The primary objective of this study is to determine if optimizing UHU rates can enhance provider morale, boost EMS provider shift satisfaction rates, and deliver quality EMS service efficiently and effectively. The study will utilize a quantitative approach to analyze UHU rates and shift satisfaction data. Additionally, surveys and interviews with EMS providers will be conducted to explore key metrics, such as EMS member satisfaction and external factors that have no relation to UHU. The study's research questions include determining the satisfaction rate for EMS providers in the VBRescue system, identifying external factors that influence provider

satisfaction, and establishing the optimal UHU rate for ambulances to enhance EMS provider satisfaction while ensuring efficiency and effectiveness in delivering EMS care to the City of Virginia Beach.

CHAPTER 3: METHODOLOGY

Introduction

This chapter provides an overview of the qualitative method and approach that was used to conduct research through an interpretive phenomenological analysis (IPA) framework. The study's objective was to investigate the complex connection between the system's efficiency and its providers' well-being by examining the daily life experiences of VBRescue EMS providers. The aim was to highlight the complex challenges that the VBRescue system faced due to the sharp decline in volunteerism and increased UHU rates, similar to the national trend (VBRescue monthly membership reports, personal communication, 2023). According to feedback from VBRescue personnel, there was a worrying trend of excessive workload, low morale, and constant overwork (VBRescue 2023 exit survey report, personal communication, 2023). As UHU rates continued to rise, concerns about provider burnout and dissatisfaction also increased. Research conducted by O'Connor et al. (2021) supports these concerns, demonstrating a clear link between high UHU rates, increased turnover rates, and decreased job satisfaction.

To navigate that intricate terrain, the researcher employed an in-depth qualitative approach. By stepping into VBRescue providers' shoes, the researcher aimed to uncover the intricate linking of UHU to key metrics like satisfaction, morale, and overall well-being. The investigation extended beyond UHU, meticulously examining external factors that influenced morale and provider workload perception. Through this comprehensive lens, the researcher sought to answer three critical questions:

1. What percentage of EMS providers are satisfied with their shifts based on the UHU rate for both volunteers and career workers?
2. What external factors affect EMS personnel satisfaction during a shift that is not captured by UHU rates?
3. What is the ideal range of UHU for ambulances to maintain a satisfied EMS workforce?

The research aspired to offer valuable insights that guided VBRescue and similar systems toward a more sustainable and fulfilling future for providers and their communities. By unraveling the complexities of the efficiency-well-being equation, the research worked to meet system needs and ensure provider satisfaction.

Research Design

The research employed a qualitative approach grounded in IPA to investigate the lived experiences of EMS providers during a daily shift and explored the connection between UHU rates and job satisfaction. IPA provided a framework for understanding individual perceptions and interpretations of phenomena. By bracketing personal assumptions and focusing on participants' lived experiences, IPA allowed for an in-depth examination of how EMS providers made sense of their daily encounters and the impact of UHU rates on their emotions, job satisfaction, and overall well-being.

This research used various methods to gather data, including semi-structured interviews, surveys, and UHU data review. The semi-structured interviews were conducted with a carefully selected group of EMS providers that included both volunteer and career workers to obtain detailed narratives about their experiences while working with different UHU rates. Surveys were utilized to collect measurable data on job satisfaction levels among a wider range of EMS

personnel, categorized based on UHU rate and employment status. The present UHU data was analyzed to provide objective insights into unit utilization patterns and to contextualize the findings of the interviews and surveys.

Interview transcripts, survey responses, and UHU data were systematically coded to identify recurrent themes and patterns related to job satisfaction and UHU rates. Constant comparative analysis was used to refine codes and ensure the trustworthiness and internal validity of the findings. The research study aimed to answer three questions.

Q1. What percentage of EMS providers are satisfied with their shifts based on the UHU rate for both volunteers and career workers?

Q2. What external factors affect EMS personnel satisfaction during a shift that is not captured by UHU rates?

Q3. What is the ideal rate of UHU for ambulances to maintain a satisfied EMS workforce?

Population and Sample Size

The study's purpose was to gain an understanding of the experiences of EMS providers at VBRescue who encountered different levels of UHU rates. It aimed to identify two distinct populations: Active VBRescue AICs, which included all currently active VBRescue volunteer providers, and VBRescue career providers, which had a subset of providers with varying UHU rates within the two AIC populations.

Due to the limited population size (n=375) and the need to ensure even distribution among categories and sub-categories, the research employed a stratified purposive sampling approach. This method aimed to achieve a proportional representation of each category (EMS shift type and provider role) within each UHU rate bracket, with a minimum sample size of five participants per subgroup. The rationale for that minimum sample size was based on practical

considerations for statistical analysis and ensuring adequate depth and richness of data within each subgroup. While larger samples would have been statistically preferable, practicality and feasibility were also considered, balancing scientific rigor with resource limitations.

The participants for the study were recruited through various methods, which included direct email invitations sent to all Active AICs, collaboration with VBRescue leadership to facilitate outreach within different categories and UHU rate brackets, and snowball sampling, where initial participants could recommend colleagues within their category and UHU rate bracket (Kirchherr & Charles, 2018). The recruitment process continued until the target sample size for each subgroup was achieved, ensuring an even distribution across all variables of interest. This strategy aimed to obtain a representative sample of VBRescue EMS Providers with varying experiences of UHU rates, consisting of 20 EMS providers with diverse perspectives.

Instruments

This section will dive into the instruments to be employed in investigating the multifaceted relationship between ambulance utilization and perception. Selecting appropriate tools was paramount to effectively address the research questions and ensure data quality. Each instrument served a distinct purpose, contributing unique data points crucial to a comprehensive understanding of the phenomenon. By employing a diversified approach, the study aimed to strengthen the robustness and reliability of its findings, enabling us to draw meaningful conclusions about the interplay between utilization and perception.

During an EMS shift, the efficiency of ambulance utilization was measured using the UHU rate as a key metric. This metric was defined by the National Association of Emergency Medical Services (2023) and was calculated by dividing the total number of staffed ambulance hours by the time spent on response activities, such as transport times and scene times. As part of

this study, the UHU rate also took into account out-of-service activities such as mechanical equipment, administrative work, and training during an EMS shift and was tracked as a separate metric. The data for this metric was directly sourced from the Virginia Beach Computer Aid Dispatch (CAD) software system for each ambulance shift, and the calculations were performed using Microsoft Power BI's calculated columns and aggregation function (VBEMS Operations Dashboard Database, personal communication, 2023). The UHU rate provided a numerical measure of service field test efficiency, which helped in identifying potential correlations with utilization patterns across different participant groups.

Standardized interviews were conducted, where the provider signed an informed consent waiver, to delve deeper into participant perspectives and experiences. These interviews incorporated a series of scale-based questions, utilizing the Likert-type format, to assess specific aspects of the intervention (Appendix D). Responses were aggregated and analyzed via a customized Power BI report, which yielded measurable insights into participant sentiment and perception. Additionally, open-ended questions within the interview facilitated the collection of in-depth feedback. This qualitative data was then subjected to thematic coding and analysis using dedicated qualitative analysis software. The software facilitated the identification of key themes and patterns within the feedback, and it allowed the researcher to explore potential linkages between participant experiences and utilization patterns within different bracketed UHU rate categories. This qualitative IPA approach helped the researcher understand the complex relationship between perception and UHU.

By employing this multifaceted approach, the researcher ensured the robustness and reliability of their findings. The UHU rate provided a measurable understanding of the unit's utilization during a shift, while the standardized interviews, employing IPA, provided invaluable

insights into participant perceptions and experiences. By exploring potential linkages between these data sets through thematic analysis and categorization based on UHU rates, the researcher aimed to illuminate the nuanced interplay between ambulance utilization and perception. The comprehensive nature of their instrument selection strengthened their ability to address the research questions and contribute valuable knowledge to the field.

Research Process

The aim of that study was to investigate the experiences of EMS providers operating within different ambulance UHU rate categories. To achieve that goal, the research employed a qualitative approach grounded in IPA. This method was particularly appropriate for exploring the subjective experiences of individuals, as it enabled the researcher to identify and interpret the underlying meaning of their accounts. The research process was divided into four key stages, which involved data collection through semi-structured interviews, transcription and analysis of the interviews, identification of themes and patterns, and interpretation of the findings. By exploring the experiences of EMS providers in different UHU rate categories, that study aimed to provide insights into the factors that would affect their work and to inform the development of policies and practices that could enhance their effectiveness and well-being.

Participant Selection and Recruitment

The study recruited participants through various methods, including direct email invitations to all future Active AICs, collaboration with VBRescue leadership, and snowball sampling (Appendix D). This ensured an even distribution across all variables of interest and aimed to obtain diverse perspectives from VBRescue EMS Providers with varying experiences with UHU rates over a thirty-day time frame. The recruitment process continued until the target sample size for each subgroup was achieved, maximizing the sample's representativeness.

Data Collection

Team conference calls were used to conduct semi-structured interviews. Prior to the interviews, participants were provided with a document that outlined their UHU rate fluctuations, and prompts were given to encourage them to reflect on specific shifts within each bracket (Appendix B). During the interviews, open-ended questions focused on overall shift satisfaction, the perceived balance between feeling "too slow" and "too busy," additional UHU factors not captured by standard systems, time spent on those factors such as driving back to the station from the hospital, frequency of incivility and positive experiences, and other factors influencing overall shift experience and time spent on those factors such as driving back to the station from the hospital (Appendix D). After the interviews were conducted, all of them were transcribed verbatim.

Data Analysis

The researcher planned to utilize Qualitative Data Analysis Software (QDAS) to conduct an in-depth analysis of the data collected. This software will help them to identify recurring themes and patterns within each UHU rate bracket. This methodical approach will enable the researcher to gain a better understanding of the data and its significance. They will be able to examine the data from various perspectives, which is essential in qualitative research. By analyzing the data in this manner, the researcher will be able to draw valid conclusions and make informed recommendations.

The next step in the study was to interpret the data through an IPA lens (Elliott & Timulak, 2021). This methodology allowed the researcher to focus on the subjective lived experiences of the participants and their sense-making processes (Elliott & Timulak, 2021). They were interested in understanding the unique and personal experiences of the participants and how

they made sense of those experiences. By using the IPA methodology, the researcher was able to uncover valuable insights into the data. These insights helped to inform further research and development in the field and provided a better understanding of the UHU rate brackets and how they would impact the lives of the participants (Elliott & Timulak, 2021).

The researcher presented the findings of their study in a clear and concise manner, highlighting the themes and interpretations within each UHU rate category. They discussed how the study's implications could be used to improve EMS policy, operational practices, and provider well-being. This rigorous and systematic approach helped them delve deeper into the subjective interpretations and meanings associated with EMS providers' experiences within different UHU rate contexts, ultimately providing valuable insights for improving VBRescue EMS system efficiency, provider well-being, and patient care.

Ethical Considerations

Conducting research with integrity and respect for participants was of utmost importance because of VBRescue's internal provider participation in the research, and this IPA project upheld the highest ethical standards throughout the process. Informed consent forms were provided to participants and clearly explained the study's purpose, procedures, potential risks and benefits, and participants' right to withdraw at any time. Written consent was obtained from the participants, and their anonymity was fiercely protected. Confidentiality was a cornerstone of this research, and interview transcripts and data analyses were anonymized by removing names and identifying information using pseudonyms or codes. Data was securely stored with restricted access, and any potentially identifying quotes or data excerpts required separate consent for inclusion. Ethical considerations extended beyond the initial consent, and the research was continuously monitored for any potential impact on participants. Any ethical concerns arising

during the study were promptly and sensitively addressed. Data security was maintained throughout the research lifetime, ensuring responsible storage and access. This research adhered to all ethical approval processes required by the NFA EFO Program, and specific details regarding these processes were included in the final research proposal and can be found in Appendix C of this document.

The IPA researcher aimed to convey the personal and intimate experiences of individuals, but they also admitted that their own experiences and biases may have influenced their interpretations, given that IPA is considered a subjective methodology (Elliott & Timulak, 2021). This meant the researcher's interpretations could have been impacted by their biases and preconceptions. The same baseline characteristics were shared as the sample: serving as an EMS provider for over 30 years, being currently employed as the EMS Division Chief of Field Operations for the VBRescue system, completion of an EMS fellowship in EMS System design, and strong understanding of UHU rates within the VBResuce system. Due to these congruencies, it was highly likely that similar life experiences were shared as described by the participants; therefore, it was important that personal feelings and perspectives were not projected on the participants or throughout the research process. In an effort to avoid this, the researcher had to remain objective and open-minded throughout the research process.

The research was conducted with a strong emphasis on ethical principles, which included prioritizing informed consent, robust confidentiality, and ongoing ethical considerations (Appendix B). These measures were put in place to ensure a safe and respectful environment for all participants. Through the use of the IPA methodology, the study was able to generate valuable insights while upholding ethical standards that reflected a deep respect for the individuals who chose to take part in the research.

Summary

The methodology employed in this was grounded in IPA and aimed to explore the lived experiences of EMS providers and understand the nuanced relationship between UHU rates and job satisfaction. The research design involved a qualitative approach, utilizing semi-structured interviews, surveys, and UHU data review. The population and sample size considerations focused on Active VBRescue AICs, including both volunteers and career workers, with a stratified purposive sampling approach to ensure representation across UHU rate brackets. Instruments encompassed UHU rates for measurable analysis and standardized interviews employing a Likert-type format for qualitative insights. The research process included four key stages: data collection, transcription and analysis, identification of themes, and interpretation of findings. Participants were recruited through various methods, and ethical considerations prioritized informed consent, confidentiality, and continuous monitoring for potential impacts on participants. The study aimed to provide valuable insights into the factors influencing EMS provider experiences and informed policies enhancing their well-being. The commitment to ethical research practices ensured a respectful environment for participants and contributed to the robustness of the study's findings.

CHAPTER 4: STUDY RESULTS

Introduction – Demographics of the Participants

In February 2024, an IPA researcher conducted live interviews with twelve active AICs from the VBRescue System using an online meeting platform. The purpose of the interviews was to explore the life experiences of EMS providers when they encounter varying UHU rates during their shifts over a recent 30-day time frame, specifically from January 16, 2024, to February 15, 2024. To better understand how UHU rates impacted EMS providers' daily lives during shifts, the study attempted to answer the following research questions (RQ):

RQ.1. What percentage of EMS providers are satisfied with their shifts based on the UHU rate for both volunteers and career workers?

RQ.2. What external factors affect EMS personnel satisfaction during a shift that is not captured by UHU rates?

RQ.3. What is the ideal rate of UHU for ambulances to maintain a satisfied EMS workforce?

The study analyzed various demographic characteristics of participants. In terms of VBRescue member type, 45.45% identified as volunteers, while 54.55% were career members. EMS certification levels varied, with 45.45% being paramedics, 36.36% EMTs, and 18.18% AEMTs. When considering total years as an AIC provider, 58.33% reported 0 to 5 years of experience, while 33.33% had over 10 years. On average, participants reported 8.93 years of experience. In terms of primary EMS shifts, 63.64% worked during the day, 36.36% at night, and none during demand shifts. Participants reported an average of 9.32 shifts per month, with 45.45% working 10 or more shifts, 45.45% 0 to 5 shifts, and 9.09% 5 to 10 shifts.

Table 1

Study Participants Demographics

Participants Results	*n*	%
Q1) VBRescue Member Type		
Volunteer	6.00	50.00%
Career	6.00	50.00%
Q2) EMS Certification Level		
EMT	5.00	41.67%
AEMT	2.00	16.67%
Paramedic	5.00	41.67%
Q3) + Q4) Total Years as an AIC		
0 to 5 Years	6.00	50.00%
5 to 10 Years	1.00	8.33%
10 or Over Years	5.00	41.67%
Average # of Years	9.95	
Q5) Primary EMS Shifts		
Days	7.00	58.33%
Demands	0.00	0.00%
Nights	5.00	41.67%
Q6) Average # of Shift *(per month)*		
0 to 5 Shifts	6.00	50.00%
5 to 10 Shifts	1.00	8.33%
10 or Over Shifts	5.00	41.67%
Average # of Shifts	8.88	

Note: The demographics of the pool participants are addressed in questions one through six (Appendix D).

In preparation for each interview, participants were provided with a detailed breakdown of their EMS shifts, offering insight into the activities carried out over the course of the 30-day

study period. These shifts were selected to represent the participants' most recent experiences, thereby enhancing the reliability of their recollection of events and perspectives. The activity records were obtained from the CAD system, ensuring accuracy and consistency in data sourcing. Therefore, each participant received a thorough overview of their shifts, including key metrics such as the shift's UHU rate, Out of Service (OoS) rate, and other activity rates specific to each shift. This comprehensive dataset amalgamates these rates, providing a holistic understanding of how participants allocated their time during shifts, and encompassing both EMS calls and additional duties performed outside of their primary quarters.

The researcher utilized a dataset and employed a stratified purposive sampling approach based on the UHU rates. This approach was used with participants for both the survey and interview phases in a proportional manner across various UHU rate brackets. This method aimed to capture diverse experiences and perspectives within each bracket, providing enriched insights during the study. Table 2 shows the EMS shifts divided into four UHU rate brackets, ranging from 0% to 30%, 30% to 40%, 40% to 60%, and 60% to 100%. The table provides averages for different metrics within each bracket, demonstrating significant differences across the UHU rate brackets. The metrics include the percentage of time spent on OoS activities, other activities, and the number of service calls made per shift.

Table 2

Bracketing of the Study Participants EMS Shift's UHU Rates

Bracket UHU Groups	# of EMS Shifts	Average of UHU Rate	Average of % OoS Activity	Average of % Other Activity	Average of # of Calls for Service
0% to 30%	19	19.70%	3.11%	34.83%	3.95
Day	**6**	**17.58%**	**4.35%**	**31.56%**	**2.50**
Night	**13**	**20.67%**	**2.54%**	**36.34%**	**4.62**
30% to 40%	18	34.61%	3.22%	38.39%	6.00
Day	**2**	**36.40%**	**6.42%**	**26.34%**	**4.50**
Night	**16**	**34.39%**	**2.82%**	**39.89%**	**6.19**
40% to 60%	27	48.54%	7.69%	20.91%	6.67
Day	**18**	**49.66%**	**10.40%**	**20.23%**	**6.72**
Night	**9**	**46.29%**	**2.27%**	**22.27%**	**6.56**
60% to 100%	15	70.34%	7.07%	15.91%	8.47
Day	**15**	**70.34%**	**7.07%**	**15.91%**	**8.47**

Note: During an EMS shift, UHU Rate is calculated by dividing the total time spent on EMS calls for service by the total time logged into CAD. OoS Rate is calculated by dividing the total time spent on OoS activities, such as training sessions, administrative obligations, mechanical ambulance troubleshooting, equipment replacement, and returning to the station due to late calls at the end of the shift, by the total time logged into CAD. Other Activity Rate is calculated by dividing the total time spent on other undefined activities, such as travel and meal breaks, while not located at their assigned station by the total time logged into CAD.

Results

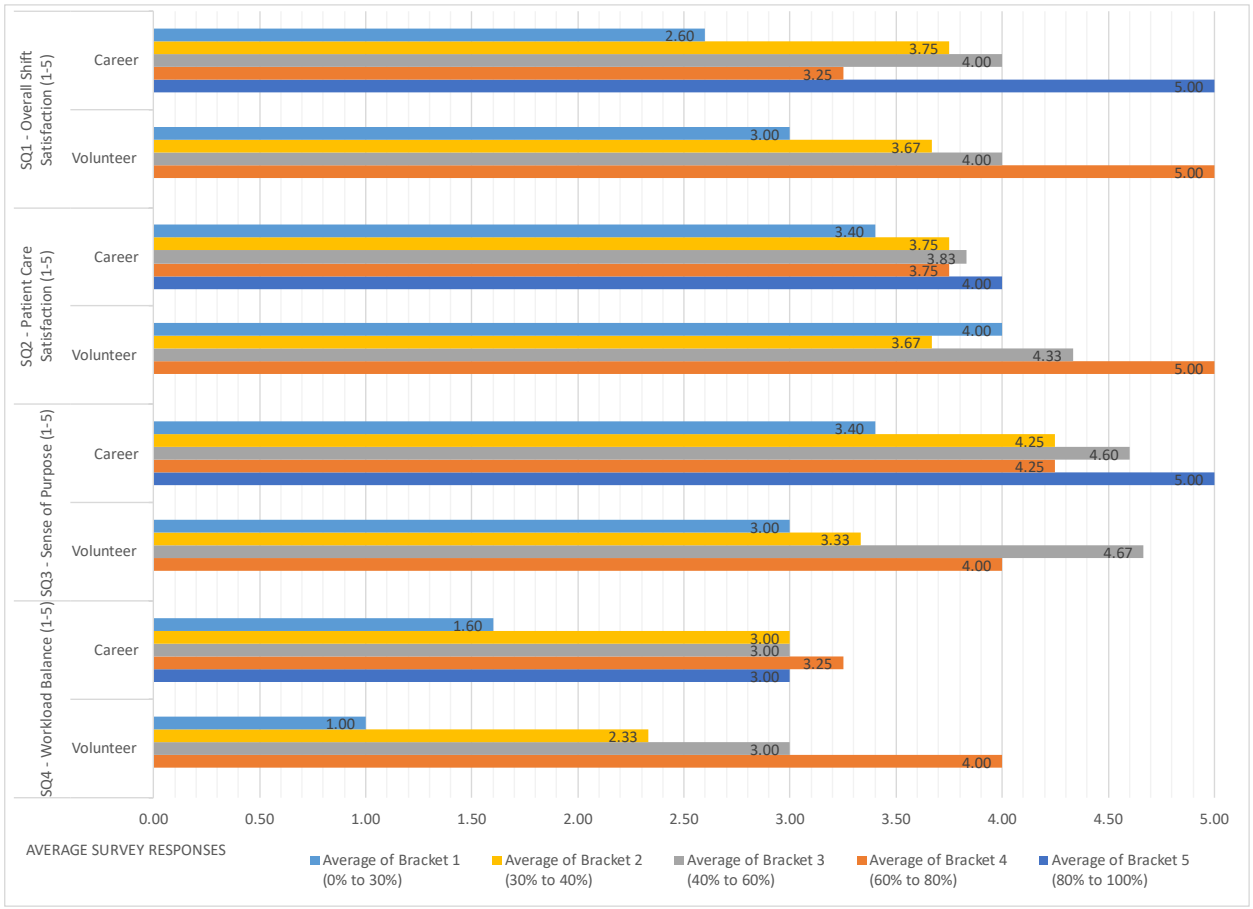
RQ1: EMS Shift Satisfaction Based on Membership Status

Survey questions utilized during a live interview via virtual meeting platform, analyzed the satisfaction levels of EMS providers concerning their shifts, focusing on the UHU rate among volunteer and career providers. Figure 1 summarizes the results of a survey conducted among career and volunteer EMS providers, focusing on three aspects: a sense of purpose, patient care satisfaction, workload balance, and overall shift satisfaction. Responses are

categorized into five groups based on previously identified UHU rate brackets. Across all categories, career and volunteer EMS providers consistently reported higher satisfaction levels. Specifically, those in the top UHU rate category scored highest on a sense of purpose, patient care satisfaction, and overall shift satisfaction, while lower categories showed progressively lower scores.

Figure 1

EMS Shift Satisfaction Survey Results: Comparing Career versus Volunteer Providers



Note: In the last 30 days, volunteer EMS providers did not experience a UHU rate greater than 80%.

RQ1: EMS Shift Satisfaction Based on Years of EMS Experience

The survey questions also analyzed EMS providers' satisfaction levels with their shifts across different levels of EMS experience. The analysis focused on the UHU rate, and the data showed that the highest satisfaction levels consistently emerge within the UHU bracket of 80% to 100% within the 0-10 years of experience bracket. As EMS experience increases, satisfaction becomes more variable, with some brackets indicating considerable fluctuations across UHU categories. The highest level of satisfaction across all categories was observed in the 0-10 years of EMS experience bracket, while the lowest levels of satisfaction were consistently observed in the 30-40 years of EMS experience bracket.

Table 3

EMS Shift Satisfaction Survey Results: Based on EMS Years of Experience

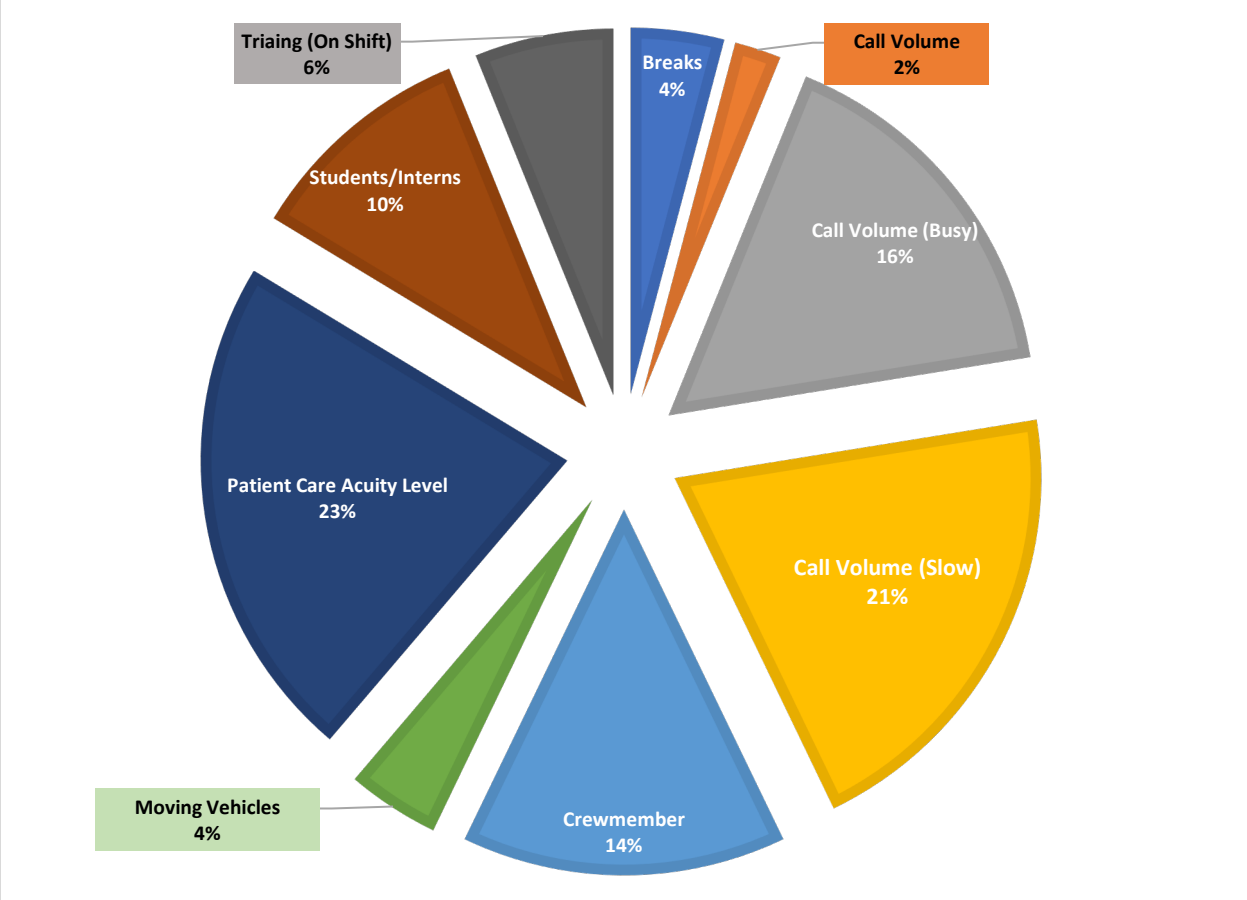
Provider's Years of EMS Experience	UHU Bracket (0% to 30%)	UHU Bracket (30% to 40%)	UHU Bracket (40% to 60%)	UHU Bracket 4 (60% to 100%)
SQ1 - Overall Shift Satisfaction (1-5)	**2.67**	**3.75**	**3.80**	**3.60**
0-10	2.67	3.67	3.86	4.50
10-20	3.00	4.00	5.00	5.00
20-30	2.00		2.00	2.00
30-40	3.00	4.00	4.00	2.00
SQ2 - Patient Care Satisfaction (1-5)	**3.50**	**3.88**	**3.90**	**4.00**
0-10	2.67	3.83	4.00	5.00
10-20	4.00	3.00	4.00	5.00
20-30	5.00		4.00	2.00
30-40	4.00	5.00	3.00	3.00
SQ3 - Sense of Purpose (1-5)	**3.33**	**3.88**	**4.56**	**4.20**
0-10	2.67	3.83	4.43	4.50
10-20	3.00	3.00	5.00	4.00
20-30	5.00		5.00	4.00
30-40	4.00	5.00		4.00
SQ4 - Workload Balance (1-5)	**1.50**	**2.88**	**3.20**	**3.40**
0-10	1.33	2.83	3.43	3.50
10-20	1.00	3.00	3.00	4.00
20-30	2.00		2.00	2.00
30-40	2.00	3.00	3.00	4.00

RQ2: External Factors Affecting EMS Personnel Satisfaction

During the live interviews, open-ended questions along with the survey questions helped identify external factors that may impact shift satisfaction that were not reflected in the UHU rates. Figure 2 provides a summary of the themes that emerged from these open-ended questions. The researcher found that many of these themes had both positive and negative impacts on the providers' shift satisfaction. The primary areas of focus for all providers, including career and volunteer, seasoned, or new providers, were patient care, patient acuity level, call volume (whether busy or slow), and their crew.

Figure 2

External Factors Themes



Note: This is based on the comments obtained from participant interview questions SQ5 (Other Factors Faced), SQ6 (Positive Experiences), SQ7 (Negative Experiences), and SQ8 (Other Comments).

Figure 2 summarizes the categories and then classifies them as positive or negative experiences. Table 4 contains supporting quotes extracted from the interview transcripts. These quotes provide additional information about the participants' viewpoints.

Table 4

External Factors Themes

Category	Subcategory	Participants Quotes
Positive Experiences		
Positive Experiences	Call Volume (Slow)	"In the middle, I kind of feel like slower shifts were fulfilling because I kept myself busy with other things"
Positive Experiences	Call Volume (Slow)	"I've noticed that I'm primarily transporting to Virginia Beach general instead of other hospitals which indicates change in staffing because I'm only answering calls in my first or second do area, which is great!"
Positive Experiences	Call Volume (Busy)	"I like to be busy, but it's I ideally if we have like the good flow, but it's 100% at the mercy of who calls when and who gets tapped to it based off where they are"
Positive Experiences	Call Volume (Busy)	"Moving and grooving pretty good"
Positive Experiences	Call Volume (Slow)	"I go into the if I'm at 4, I'll go do stuff in the supply room or to the straighten out the card, or look at another ambulance, or I'll fill up oxygen bottles or, you know, or I'll go into the weight room and get a nap"
Positive Experiences	Call Volume (Busy)	"If it's during the week night when I'm running, I would prefer it to be a little slower, at least busy until midnight than nothing after midnight cut I do have to work the next day But Friday night, Saturday night, 100%. Lets GO."
Positive Experiences	Call Volume (Busy)	"I know that I prefer being busy, so I'm more dissatisfied when I am a little busier and I can go out and do things. However If I met this

		same busy parts of the city for several sets in a row can become a negative."
Positive Experiences	Call Volume (Busy)	"Definitely positive experiences overall.; I like being at Plaza Rescue because your Center City and you know when you look at it, you know, especially servicing the 264 corridor right there, you can go any; "
Positive Experiences	Patient Care Acuity Level	"I provide some good care satisfied with the patient care mix."
Positive Experiences	Patient Care Acuity Level	"I ran a CIT calls where there were great interaction with PD and FD."
Positive Experiences	Patient Care Acuity Level	"There's still generally one to two true ALS calls, a shift that I'm able to utilize the skills, and I personally enjoy that."
Positive Experiences	Patient Care Acuity Level	"Provider AEMT Level skills like giving pain management medications."
Positive Experiences	Patient Care Acuity Level	"Partner, supervisor helpful really great to debrief things with two postictal patients that were combative and the firefighters were really helpful"
Positive Experiences	Patient Care Acuity Level	"Really appreciated going to more like higher acuity calls and that like I some supervisors will you know save the paramedic trucks more for like the higher quality ones."
Positive Experiences	Patient Care Acuity Level	Patient punching me on a call, So that ended up being like it was a negative experience that ended up leading to positive experiences because of the support I received from the my agency and PD.
Positive Experiences	Crewmember	"As an AEMT, I will say I think the best patient care that I've provided has been when I am on a paramedic truck because both myself and the medic are usually on the same page and we're able to multitask and be more efficiently than if I'm the sole AEMT provider"
Positive Experiences	Crewmember	"I sometimes prefer being an advanced (AEMT) truck, but it all depends on paramedic I am with. If I'm with someone who understands that I'm somebody who wants to practice to my full scope, they are more willing to let me do my thing before stepping in."

Positive Experiences	Crewmember	"Liked working with his partner he's a good provider and he's fun to fun to work with and I find that and that always helps to shift if you're with someone that you get along with well."
Positive Experiences	Crewmember	"Yeah, that's one of the main reasons I joined this is because when I left the military, I missed being on a small team with a mission."
Positive Experiences	Students/Interns	"We had a small MC I with entrapments, Sepsis, STEMI, Multiple Codes truly sick patient and so the fact that all three of us are on truck is truly ideal and helpful"
Positive Experiences	Students/Interns	"I personally feel a lot more satisfied when I have a student or an intern."
Positive Experiences	Students/Interns	"I like having an intern or student like I'm very passionate about training. I like to take the time to teach people in my free time, but that does just add to the workload, feel like take a good bit of time.
Positive Experiences	Breaks	"I feel like in the last like year or so I feel like people been like just a lot more aware of how kind of busy we are as a system and I know like some of the divisors will like call people to go like out of service very briefly just to get something for a meal or you know we'll be watching the board and you know at the end of shift change someone who's like getting off to a crew that's coming on."
Positive Experiences	Training (On Shift)	"Pit Crew Training at HQ"
Positive Experiences	Training (On Shift)	As an EMT, "RSI Training with the Paramedics, the fact that everybody learned something and we all got to see the on RSI and action and A and I got to intubate the patient successfully and we saw the whole blood set up, but it wasn't delivered"
Positive Experiences	Training (On Shift)	"Airway Training which is always a positive experience; We had some downtime, and we had different captains and our assignments and FTOs there who'd set up a little difficult airway setting stations for us, which we were working through."
Negative Experiences		
Negative Experiences	Call Volume (Slow)	"Only one transport!"

Negative Experiences	Call Volume (Slow)	"I don't like slow days and I do not like going to going to 6 or 13 is like is like being transported to hell; I am so, so bored; I find myself looking for things to do and leaving the shift pretty, pretty dissatisfied, but then they're going 16 or 9 that stay busy."
Negative Experiences	Call Volume (Slow)	"I'm used to being at the higher end of UHU and it's not been that way, and that's personally frustrating, but I know other people like being on the slower side and it has kind of been this way since the increasing staffing"
Negative Experiences	Call Volume (Slow)	"It's now the most common sentiment, at least on our shift, is not a lot of us are super fond at the idea of two weeks in the county."
Negative Experiences	Call Volume (Slow)	"Being in the county spikes my anxiety just waiting for the call to drop"
Negative Experiences	Call Volume (Slow)	
Negative Experiences	Call Volume (Slow)	"Enjoy summer months over winter months"
Negative Experiences	Call Volume (Busy)	"I got stuck with a late call"
Negative Experiences	Call Volume (Busy)	"From the county, we spent all day, all pretty much all day Uptown and did not get off on time"
Negative Experiences	Call Volume (Busy)	"Got my mileage in that night "
Negative Experiences	Patient Care Acuity Level	"Dealing with those kinds of the frequent flyer thing is not really reflected in anything that's on the CAD."
Negative Experiences	Patient Care Acuity Level	"So like some nights you get tapped to just grandma's, got a cough because she said COVID for a week and she wants to go to the hospital and it's just that's the same call all night and it makes for a very mundane night."
Negative Experiences	Patient Care Acuity Level	"A family member drove me nuts"
Negative Experiences	Patient Care Acuity Level	"I was a taxi driver type of thing, so if I've been I was very confident and effective and what I delivered three was somewhat neutral."
Negative Experiences	Call Volume	"When on BLS ambulance we are always getting canceled for a paramedic truck and this is boring for me."
Negative Experiences	Crewmember	"I had poor interaction with a particular partner"
Negative Experiences	Crewmember	"I'm just driving and I'm not in the back to experience that they're doing cool stuff."
Negative Experiences	Crewmember	"My assignment for the day changed at the last minute, so I text her a phone call about the change with instructions would've been nice"

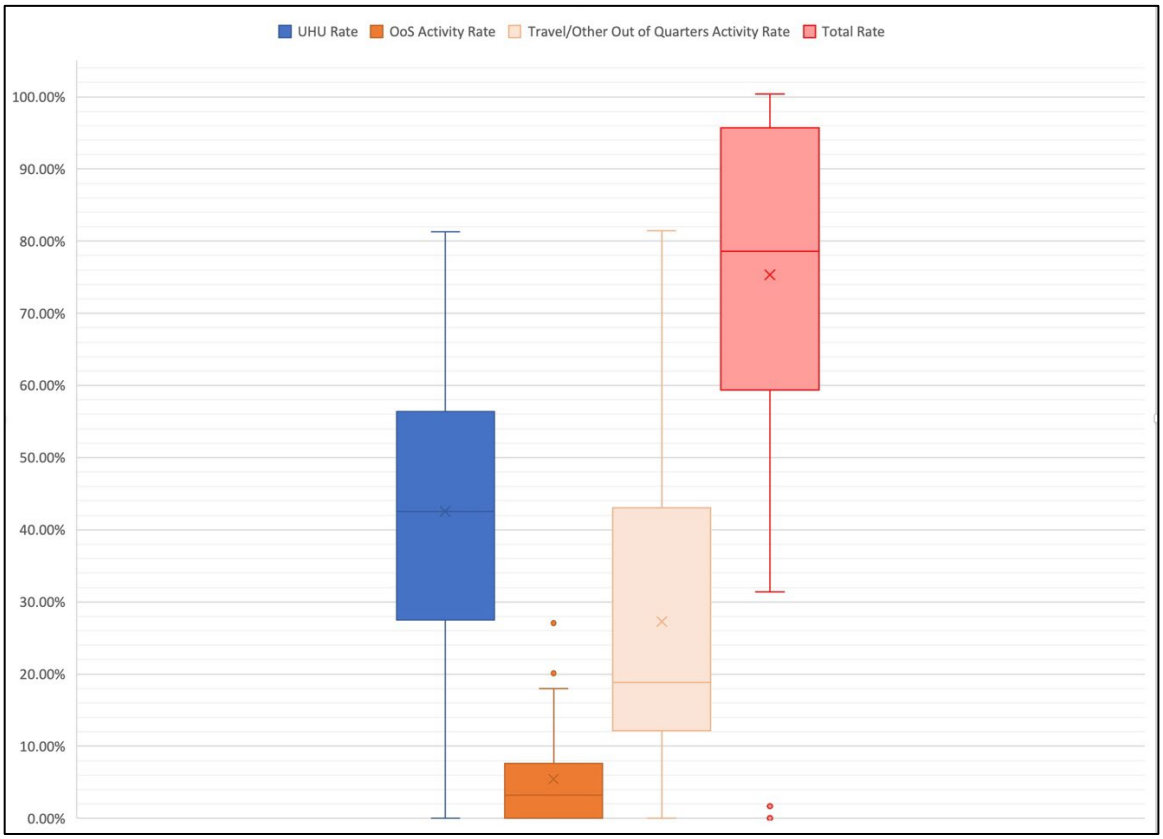
Negative Experiences	Students/Interns	"So, but there are some days where it's nice to just be me and my partner, because then you can definitely get that groove between just you and them through the calls and you're not having to."
Negative Experiences	Students/Interns	"When on BLS ambulance we are always getting canceled for a paramedic truck and this is boring for me."
Negative Experiences	Breaks	"If it's the end of the really busy day and I haven't had the chance to have, you know, like a couple of coffee at 2:00 o'clock or something like that, I'm feeling a little mental fatigue"
Negative Experiences	Moving Vehicles	"There was one day where we spent a good portion of the day jogging trucks around"
Negative Experiences	Moving Vehicles	"Shuffling Vehicles Again"

Notes: This is based on the comments obtained from participant interview questions SQ5 (Other Factors Faced), SQ6 (Positive Experiences), SQ7 (Negative Experiences), and SQ8 (Other Comments).

Furthermore, the overall shift experience affects provider satisfaction on a daily basis. Figure 3 details a comparison of UHU rates, OoS rates, Travel/Other Activities, and their combined total rates. The overall rate provides the total percentage of time when the provider was engaged in a type of activity outside of their assigned station.

Figure 3

Comparing the Different Activity Rates



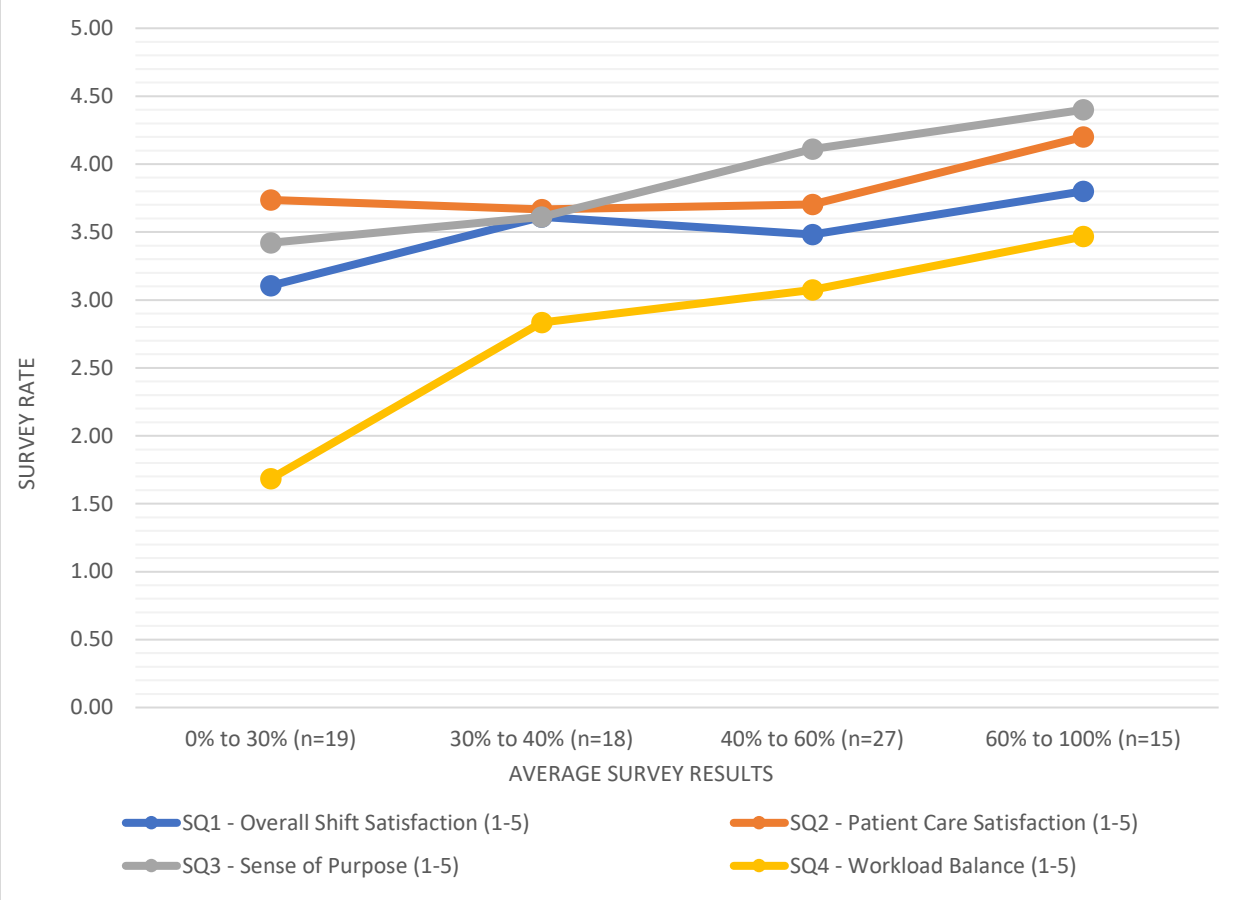
Notes: During an EMS shift, the UHU Rate is calculated by dividing the total time spent on EMS calls for service by the total time logged into CAD. OoS Rate is calculated by dividing the total time spent on OoS activities, such as training sessions, administrative obligations, mechanical ambulance troubleshooting, equipment replacement, and returning to the station due to late calls at the end of the shift, by the total time logged into CAD. Other Activity Rate is calculated by dividing the total time spent on other undefined activities, such as travel and meal breaks, while not located at their assigned station by the total time logged into CAD. Total Rate is the combination of UHU Rate, OoS Rate, and Other Activity Rates divided by the total time logged into CAD.

RQ3: Ideal UHU Rate to Maintain an EMS Provider Satisfaction

An examination of UHU rates in combination with the feedback collected from healthcare providers in Figure 4 displays a positive relationship between UHU and various key indicators of provider satisfaction. The statistics imply that as UHU levels increase, so does satisfaction in terms of shift work, patient care delivery, and overall sense of purpose. However, it is essential to note that in tandem with growing UHU, the workload balance metrics may alter, with providers reporting feeling "often busy" or "too busy." Specifically, the data indicates that this tipping point is likely to be within the UHU range of 60% to 100%.

Figure 4

Comparing UHU Rates to Survey Questions



Summary

The aim of this study was to explore the daily experiences of VBRescue EMS providers and investigate the correlation between their UHU rates and job satisfaction. The chapter summarizes the activities of the providers on each shift using UHU rates and other metrics. The providers' life experiences during these shifts were obtained through surveys and open-ended questions and were subsequently categorized into different groups based on UHU rates. This information helped identify various themes based on the provider's membership, years of experience in the department, and their expectations for a successful shift.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Summary of the Results

This qualitative study, employing Interpretive Phenomenological Analysis (IPA), conducted live interviews with twelve active EMS providers from the VBRescue System, aiming to understand the impact of UHU rates on EMS provider satisfaction and to identify external factors influencing satisfaction during shifts. The research explored three main questions: the satisfaction levels of EMS providers based on UHU rates for both volunteers and career workers, external factors affecting EMS personnel satisfaction not captured by UHU rates, and the ideal UHU rate to maintain a satisfied EMS workforce.

The study examined a diverse group of EMS provider shifts stratification in relation to UHU rates within the VBRescue System. The participants included both volunteers (45.45%) and career members (54.55%), with varying certification levels of paramedics (45.45%), EMTs (36.36%), and AEMTs (18.18%). The EMS experience of the participants ranged from 1 to over 32 years, with an average of 9.74 years. The majority of shifts occurred during the day (63.64%),

with an average of 9.32 shifts per month. This varied demographic provided valuable insights into EMS provider experiences and satisfaction during shifts.

Based on the survey data and open-ended questions, both career and volunteer EMS providers reported consistently higher levels of satisfaction across all categories. Those in the top UHU rate category scored the highest on a sense of purpose, patient care satisfaction, and overall shift satisfaction, while lower UHU rate categories showed progressively lower scores. The study also identified external factors that affected shift satisfaction, such as call volume, patient care acuity level, crew dynamics, training opportunities, and logistical considerations. However, the UHU grows, workload balance metrics may change, with providers reporting feeling "often busy" or "too busy." The data suggests that this tipping point is likely within the UHU range of 60%. This information from diverse EMS demographics provided insights into the dynamics of shift satisfaction, workload balance, sense of purpose, and patient care satisfaction.

Conclusions and Recommendations

This study's analysis of VBRescue EMS providers' experiences sheds light on the complex factors influencing their satisfaction and sense of purpose. This aligns with prior research highlighting workplace incivility as a major deterrent, with nearly half of EMS professionals experiencing it weekly, leading to stress and turnover intentions (Cash et al., 2017). Limited opportunities for compassion and service can also negatively impact satisfaction and contribute to burnout (Blau & Chapman, 2016).

This VBRescue study emphasizes the importance of a holistic approach, looking beyond just the type of emergencies encountered (UHU) to understand provider experiences. Key themes extracted from surveys and interviews underscore the multifaceted nature of satisfaction, demonstrating that it goes beyond any single factor. The analysis, encompassing diverse

demographics, provides insights into the dynamics of shift satisfaction, workload balance, sense of purpose, and patient care satisfaction.

RQ1: Unit Hour Utilization Rate Factors

This research examined the interplay between workload intensity and job satisfaction among VBRescue EMS providers and revealed a complex interaction between these variables. While there was an initial positive correlation between higher UHU rates and shift satisfaction among all categories, a critical threshold was identified at the 60% UHU rate. Beyond this point, workload balance became a significant concern, with providers reporting feelings of overload. Notably, this perception of workload varied based on EMS experience. Interestingly, providers with 20-30 years of experience expressed a preference for shifts offering both rest periods and exposure to high-acuity calls.

Qualitative data supported these quantitative results, highlighting the significant role of call volume in shaping satisfaction. Some providers valued less busy shifts for the opportunity to complete additional tasks or obtain respite, while others preferred the engagement associated with busier periods. Busy shifts offered a sense of fulfillment, but excessive workload could lead to fatigue and long-term dissatisfaction, potentially impacting retention. High UHU rates have been shown to increase turnover and decrease job satisfaction among EMS personnel, similar to recent research (O'Connor et al., 2022).

Furthermore, years of EMS experience influenced how UHU impacted perceptions. Newer providers exhibited a tendency towards higher satisfaction with increased UHU levels, suggesting a potential accommodation effect. Conversely, satisfaction with workload balance appeared to decline with experience, possibly indicating a shift in preference towards prioritizing patient acuity over simply maintaining activity levels. Regardless of how busy they were, both

career and volunteer providers valued their break time and felt supported when their EMS supervisors ensured they received adequate break time.

RQ2: External Factors

This research explored external factors shaping the experiences of EMS providers and identified several key themes. Thematic analysis revealed that call volume, patient care acuity level, crew dynamics, training opportunities, and logistical considerations significantly influence both shift satisfaction and operational efficiency. Patient acuity emerged as a central factor impacting provider satisfaction, with high-acuity calls leading to greater fulfillment as providers could effectively apply their skills.

Crew dynamics, particularly among volunteers, were found to be another critical influence on EMS experiences. Positive interactions characterized by clear communication and mutual respect were linked with increased satisfaction and teamwork. Conversely, negative interactions, such as underutilization of skills or lack of partner recognition, detracted from overall satisfaction, emphasizing the need for further training of EMS providers to understand the scope of practice of Advanced EMTs.

The presence of students or interns generally yielded positive perceptions, offering opportunities for mentorship and professional development. However, the additional training responsibilities associated with this presence highlighted the importance of effective time management and support mechanisms. The study also identified negative crew interactions, unexpected assignment changes, and disrupted breaks as sources of discontent, reflecting the multifaceted nature of EMS work environments.

Furthermore, logistical challenges, such as frequent vehicle movements, were linked to increased stress and operational inefficiency during shifts. Hands-on experiences, such as pit

crew training and airway management sessions, positively influenced skill acquisition and provider confidence. However, logistical hurdles, such as sudden assignment changes or vehicle reassignments, presented operational barriers and contributed to feelings of frustration and inefficiency among EMS personnel. Similarly, the healthcare sector is witnessing an alarming rise in burnout levels among its workforce due to the challenging and often unpleasant working conditions (Crowe et al., 2017). These findings collectively underscore the multifaceted nature of external factors influencing EMS provider experiences and highlight the need for targeted interventions to enhance both job satisfaction and operational effectiveness within the EMS environment.

RQ3: Ideal UHU Rate

Although an initial positive correlation was observed, further analysis identified a critical threshold within the UHU range of almost 60%. This threshold represents a point beyond which providers start to impact workload balance negatively. However, due to the bracketing of UHU rates, this research was unable to determine an ideal UHU rate. Nonetheless, external factors and years of EMS experience can help in framing the ideal UHU rate and expectation.

The findings suggest that UHU rates do not solely determine provider satisfaction. Other factors also play a key role in shaping provider experiences. Therefore, a comprehensive evaluation of shifts, taking into account various dimensions, is crucial to understand EMS provider satisfaction. These findings emphasize the intricate nature of EMS provider satisfaction and underscore the importance of considering factors beyond UHU rates.

Limitations

This research on the impact of UHU rates on AIC's shift satisfaction within the VBRescue system encountered several limitations, which should be acknowledged to provide

context and insight into the findings. The sample size utilized in this qualitative research was constrained, consisting of only 12 interviews. Despite efforts to ensure representation by including an equal proportion of volunteer and career providers with varying years of EMS services, it is essential to recognize that this sample size accounts for merely 3% of the AIC personnel within VBRescue. Consequently, the findings may not fully encapsulate the diverse perspectives and experiences within the organization.

The timeframe of the review was limited to a 30-day snapshot during the winter months in the city of Virginia Beach. This narrow timeframe fails to capture seasonal variations in call volumes and patient acuity, particularly during the summer months when demand for EMS tends to escalate. Additionally, the majority of volunteers only operate four shifts per month, potentially limiting the scope of data collection and failing to capture their typical call volume experiences. Furthermore, the recent influx of career personnel within the VBRescue system during the 30-day snapshot may have influenced the results. This influx coincided with a decrease in UHU rates, averaging from 53.3% to 44.4% UHU per month (VBEMS Operations Dashboard, personal communication, 2023). While this shift in personnel composition may have implications for AIC roles within the VBRescue system, the limited timeframe of the research prevents a comprehensive analysis of its effects.

The position held by the division chief of field operations within a semi-military organization like VBRescue may have inadvertently influenced the interview process. The perceived rank of the interviewer could have affected the responses provided by the interviewees, potentially introducing bias into the research.

Implications and Recommendations to the Field

This research has shed light on the limitations of UHU rates as the sole metric for gauging AIC shift satisfaction within the VBRescue system. While UHU rates offer a basic understanding of ambulance utilization, they fail to capture the entirety of an EMS provider's shift experience. For instance, UHU rates do not account for the severity of patients' conditions (call acuity) encountered during a shift. Imagine two scenarios with the same UHU rate: one where an ambulance crew tackles multiple high-acuity emergencies and another where they respond to primarily non-critical calls. Clearly, the providers' experiences and satisfaction levels would differ significantly in these scenarios. Similarly, UHU rates do not reflect the time spent on non-emergency activities like paperwork or equipment maintenance (out-of-service activities) or the impact of long travel times between calls on crew morale.

To gain a more comprehensive perspective, VBRescue should consider developing a multi-dimensional dashboard. This dashboard would move beyond UHU and incorporate a wider range of metrics. These metrics could include factors such as call acuity (severity of patients' conditions), out-of-service activities (time spent on paperwork or equipment maintenance), travel times between calls, crew composition (including the presence of interns or students), and even regular provider feedback on their shift experiences. By tracking these additional factors and learning and adjusting thresholds, VBRescue can build a more holistic picture of what truly contributes to provider satisfaction during their shifts. For instance, the dashboard might reveal correlations between high call acuity and low morale or identify extended travel times as a contributing factor to crew fatigue. This deeper understanding can then be leveraged to improve resource allocation, optimize crew scheduling, and ultimately foster a work environment that is more conducive to provider satisfaction and well-being.

Implementing such a system may not be without its challenges. Collecting and integrating data from various sources, such as electronic medical records, ambulance CAD data, and crew feedback surveys, could require additional staff time or resources. Furthermore, analyzing the complex interplay between these diverse factors might necessitate robust statistical methods but potentially utilize current data analysts and data analysis already in place. There may also be a need to shift the departmental culture away from a singular focus on UHU as the primary metric. Staff and leadership may require training in interpreting the new, multi-dimensional data. However, the potential benefits of this approach far outweigh the initial hurdles.

Recommendations for Future Research

This capstone project lays the groundwork for future research endeavors that aim to create a more holistic understanding of how patient care characteristics influence provider satisfaction within the EMS field. Future studies should prioritize extending data collection periods to capture a wider range of patient acuity levels. This extended data will be crucial for establishing optimal UHU rates and identifying the types of calls that positively impact provider experience.

The literature review has revealed that a recent study suggests high UHU rates can lead to increased turnover and decreased job satisfaction among EMS personnel (O'Connor et al., 2022). However, this research and other literature reviews do not show how long EMS personnel must be exposed to high UHU rates before they experience fatigue and burnout. Therefore, researchers should consider exploring the potential of real-time survey responses to improve data accuracy and immediacy, which will lead to more precise datasets for more refined analysis. Researchers should conduct longitudinal studies be conducted over extended periods to highlight the trends

and effects of high-call and low-call volume experiences. By identifying threshold periods and their impact on providers, researchers can develop workload management strategies that prioritize both patient care quality and provider well-being and inform optimal shift durations.

Conclusion

In conclusion, this qualitative study delved into the daily experiences of VBRescue providers, focusing on the correlation between UHU rates and shift satisfaction. The qualitative IPA approach reveals that provider satisfaction is a multifaceted construct influenced by various factors beyond just UHU rates. Therefore, this study emphasizes the need for a comprehensive assessment of healthcare providers' shift experience to gain a holistic understanding of their experiences.

The analysis revealed that while there exists an initial positive correlation between workload intensity, measured by UHU rates, and job satisfaction, a critical threshold emerges within the 60% UHU range. Beyond this point, workload balance becomes a significant concern, particularly among providers with extensive EMS experience. Interestingly, newer providers exhibit higher satisfaction with increased UHU levels, suggesting a potential accommodation effect. However, as experience grows, satisfaction with workload balance declines, indicating a shift in preference towards prioritizing patient acuity over sheer activity levels.

External factors, including call volume, patient acuity, crew dynamics, training opportunities, and logistical considerations, significantly shape EMS provider experiences. Patient acuity emerged as a central factor impacting provider satisfaction, while positive crew dynamics and adequate training were associated with increased satisfaction and teamwork. Conversely, logistical challenges, such as frequent vehicle movements, contributed to increased stress and operational inefficiency.

Despite efforts to address these issues, the study encountered several limitations, including a small sample size and a limited timeframe. Recommendations for future research include extending data collection periods to capture seasonal variations in call volumes and patient acuity, exploring real-time survey responses for richer datasets, and conducting longitudinal studies to identify trends and optimal shift durations.

In light of these findings, VBRescue should consider developing a multi-dimensional dashboard to track a wider range of metrics beyond UHU rates. Such a system could provide a more comprehensive understanding of provider satisfaction and facilitate targeted interventions to enhance both job satisfaction and operational effectiveness within the EMS environment.

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APPENDICES

APPENDIX A

Participant Invitation

Email Title: Seeking Your Voice: Contribute to Research on EMS Workload Related to UHU Rates

Dear VBRescue Active EMS Providers,

I am writing to invite you to participate in a research study that I am conducting at the National Fire Academy for my Executive Officer Program. The study aims to enhance our understanding of the impact of unit-hour-utilization (UHU) or call volume on your daily EMS shifts.

The research paper proposes to investigate the impact of UHU on EMS provider stratification, specifically the relationship between UHU rates and EMS provider job satisfaction and retention rates. To achieve this, the study is looking to recruit around 25 to 30 VBRescue active attendants in charge (AIC) willing to participate voluntarily. Therefore, I am seeking both volunteer and career EMS members with varying years of experience who mainly work day, night, or demand shifts.

Below is some additional information about participating in the study:

Study Details:

- Interview Dates: February 17th to 25th, 2024.
- Time Slots: Multiple options available (details in the attached invite)
    - https://outlook.office365.com/owa/calendar/UnitHourUtilizationImpactonEMSProviderStudyParticipant1@vbgov.onmicrosoft.com/bookings/
- Platform: Microsoft Teams (meeting link in the confirmation email)

Preparation for Your Interview:

Review the Interview Consent Form: You'll be provided an interview consent form to be reviewed before the interview. It outlines the study's purpose, questions, and your rights as a participant. Participation is voluntary and won't affect your position or employment with the VBRescue system.

Receive a List of Your Recent Shifts:
You'll be provided a list of your recent shifts over the last 30 days and the related UHU you calculated for each shift.

Review of Recent Shifts:

EMS Shift Date	Ambulance Assignment	UHU Rate (# of calls)	Additional Activities Rate (Hours)
Thursday, February 2, 2024	A712q	0.75 (9)	0.4 (2.0) - Community Outreach, 0.3 (1.5) - Patient Care

What to Expect During the Session:

- **Format:** Approximately 60 minutes, in person or via video conferencing.
- **Content:** Combined interview and survey.
- **Topics:** Share experience and provide data on workload, stress levels, and satisfaction under varying UHU conditions. General EMS work questions may also be included for context.

Confidentiality Assurance:

- Your information is strictly confidential.
- Your name won't be used in reports; responses will be anonymized.
- Ethical guidelines will be strictly adhered to.

Contact Information:

For details or questions, contact us at jmeyer@vbgov.com or (757) 385-5057.

Your unique perspective is invaluable in understanding the impact of UHU on EMS providers. We deeply appreciate your time and consideration.

Thank you in advance.

Jeffrey J. Meyer
National Fire Academy
Executive Fire Officer Student
O: 757-385-5057 | C: 757-692-6217 |jmeyer@vbgov.com

APPENDIX B

Participant Instructions

Thank you for agreeing to participate in my research study at the National Fire Academy. I am excited to learn from your valuable experiences as an EMS provider and gain insights into how the unit-hour-utilization (UHU)/call volume affects your daily EMS shift. The primary goal of this study is to shed light on this crucial aspect of your work and provide guidance to improve the daily shift experience and retention of EMS providers within the VBRescue system, as well as other similar EMS systems.

Your interview is scheduled for Monday, January 15th, 2024, at 1:00 PM via Microsoft Teams. The link can be found in the attached meeting invite.

Prior to your interview:

1. Please carefully review the attached Interview Consent Form. It explains the study's purpose, the types of questions you will encounter, and your rights as a participant. Remember, participation is completely voluntary, and you can choose not to participate or withdraw at any point without penalty. Your decision will not affect your position within VBRescue or your employment.

2. Review the definition of ambulance UHU, which is calculated by dividing the total number of staffed ambulance hours by the time spent on response activities such as transport time and scene time.

3. Please take some time to reflect on your recent EMS shifts *(30-day time frame)*. Look at the attached list of your recent shifts and their corresponding UHU rates. This reflection will help you have a more fruitful conversation with me during the interview. Also, consider any other factors that might have affected your EMS shift experience.

2. Get ready for an in-depth exploration: Your session with me will combine elements of both an interview and a survey. You will have the opportunity to:
    - Share your detailed experiences: Open-ended questions will allow you to delve deeper into the specific challenges and triumphs you faced with different UHU rates during your shifts.
    - Provide valuable data: Targeted survey questions will gather essential information about your workload, stress levels, and overall satisfaction under varying UHU conditions.

What to expect during the interview and survey:

- The session will last approximately 60 minutes and will be conducted in a private and confidential setting, either in person or remotely via video conferencing.
- We will focus on your specific experiences with different UHU rates, drawing on your reflections from the provided list.
- Some general questions about your role and EMS work may also be included to provide context.
- Remember, there are no right or wrong answers – your honest feedback is invaluable to this research.
- Feel free to ask any questions you may have throughout the session.

Confidentiality is my top priority:

- All information you provide will be kept strictly confidential. Your name will not be used in any reports or publications; your responses will be anonymized.
- I am committed to protecting your privacy and adhering to all ethical guidelines.

By sharing your unique perspective, you'll contribute significantly to a better understanding of the impact of UHU on EMS providers. Your insights will play a crucial role in future efforts to improve working conditions and provider satisfaction.

If you require more details, please feel free to contact me via email at jmeyer@vbgov.com or by phone at (757) 385-5057.

I deeply appreciate your time and consideration!

Thank you in advance.

Jeffrey J. Meyer
National Fire Academy
Executive Fire Officer Student
O: 757-385-5057 | C: 757-692-6217 |jmeyer@vbgov.com

APPENDIX C
Interview Consent Form

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Jeffrey Meyer from the National Fire Academy (NFA) and Columbia Southern University. The purpose of this study is to develop a better understanding of a critical issue in the fire and emergency services. This study will contribute to the researcher's completion of their final project for the Executive Fire Officer program.

Research Procedures

Should you decide to participate in this research study, you will be asked to sign this consent form once all of your questions about the study have been answered to your satisfaction. The study consists of an interview and survey that will be administered to individual participants. You will be asked to provide answers to a series of questions related to your experience within a particular community. **A video (MS Teams) recording of the interview will be taken for transcription purposes. The video file will be deleted at the conclusion of the study and will not be shared with anyone other than the researcher.** You may turn off your camera if you do not wish to be filmed.

Time Required

Participation in this study will require approximately 60 minutes of your time.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).
The NFA, Columbia Southern University, and its contractors take no responsibility for the actions or outcomes of the research study.

Benefits

There are no direct benefits to the participant; however, information from this study may benefit your, and other communities, in the future.

Incentives

There are no incentives (financial or otherwise) associated with participation in this study.

Confidentiality

The results of this research will be presented to NFA and Columbia Southern University program faculty and students. The results of this project will be coded in such a way that the respondent's identity will not be attached to the final form of this study. The researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers (including video recordings) will be destroyed. Final aggregate results will be made available to participants upon request.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion, or you would like to receive a copy of the final aggregate results of this study, please contact:

Jeffrey Meyer
Student
National Fire Academy
jmeyer@vbgov.com

Dr. Justin Heim
Course Manager
Columbia Southern University
Justin.Heim@columbiasouthern.edu

Giving of Consent

I have read this consent form, and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have received satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

☐ I give consent to be filmed and audio recorded during my interview. _____ (interviewee initials)
☐ I give consent to be audio recorded during my interview. _____ (interviewee initials)

Interviewer Signature		**Date**:	02/18/2024

Interviewee Signature		**Date:**	

APPENDIX D

Semi-Structured Interview Guide / Survey Questions

1) What is your EMS Certification Level?
2) Are you a volunteer or a career member of the VBRescue system?
3) How long have you been an active attend-in-charge (AIC) with VBRescue? *(Months)*
4) Have you been active AIC with other EMS Systems, and if so, for how long?
5) What type of EMS shifts do you normally run as a member of VBRescue?
    a) Days (0600–1800)
    b) Nights (0600-1800)
    c) Other (demand shift or personal set schedule). If so, what type of shift and why?
6) How many shifts, on average, do you run a month with VBRescue? *(Hours)*

EMS Shift Survey Questions for UHU Bracket Group 1

Answer the following survey questions based on the Bracketed Group 1 EMS shifts.

B1) Overall Shift Satisfaction (1-5):

1. Strongly dissatisfied: These shifts were incredibly frustrating and unfulfilling.
2. Somewhat dissatisfied: There were some aspects I didn't enjoy, but overall, they weren't bad.
3. Neither satisfied nor dissatisfied: My feelings about these shifts are neutral.
4. Somewhat satisfied: These were generally decent shifts with some positive experiences.
5. Strongly satisfied: I felt happy, motivated, and fulfilled during these shifts.

B2) Patient Care Satisfaction (1-5):

1. Strongly dissatisfied: I felt I wasn't able to provide the best possible care to my patients.
2. Somewhat dissatisfied: There were some limitations to providing optimal care that bothered me.

3. Neither satisfied nor dissatisfied: My satisfaction with patient care was mixed.
4. Somewhat satisfied: I was able to provide good care to most patients.
5. Strongly satisfied: I felt confident and effective in delivering excellent patient care.

B3) Sense of Purpose (1-5):

1. Strongly disagree: I didn't feel a strong sense of purpose during these shifts.
2. Somewhat disagree: My sense of purpose was limited or unclear at times.
3. Neutral: My sense of purpose fluctuated during these shifts.
4. Somewhat agree: I often felt a strong sense of purpose during these shifts.
5. Strongly agree: I felt a clear and powerful sense of purpose throughout these shifts.

B4) Workload Balance (1-5):

1. Always too slow: These shifts were consistently boring and uneventful. I felt underutilized and frustrated.
2. Often too slow: I frequently felt like I wasn't busy enough during these shifts and wished for more action.
3. Balanced: I felt like I had a good mix of manageable workload and periods of activity during these shifts.
4. Often too busy: I frequently felt overwhelmed and stressed by the workload during these shifts. It was challenging to keep up with patient care reports.
5. Always too busy: These shifts were relentless and exhausting. I never felt like I had enough time to rest, eat, or keep up with reports.

B5) Did you encounter any other factors during your EMS shift that were not recorded by the CAD system and had an impact on the operations of the shift?

If yes, please describe those factors and indicate how much time was spent dealing with them.

B6) How many times, on average, did you experience positive experiences? If so, can you provide some examples?

B7) How many times, on average, did you experience incivility experiences? If so, can you provide some examples?

B8) Are there any additional comments you would like to make about your EMS shift life experience that may not have been captured?

Thank you for offering to participate in my research study. Your response will be a valuable part of my study. Rest assured that your identity will remain confidential. The survey will only collect information such as whether you are a career or volunteer, your shift preference, and years of service. These will be the only identifiers used for the survey results. As the researcher, I assure you that I will ensure the privacy and confidentiality of the survey. Do you have any questions for me?