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Evaluating the 24/72 shift schedule in the fire service: agency experiences and perceived impacts

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Introduction: Firefighters often work extended schedules, including 56-hour workweeks, that may contribute to fatigue, disrupted sleep, and negative physical and mental health outcomes. These concerns have increased interest in alternative shift models that allow for longer recovery periods. One emerging approach is the 24/72, or “D shift,” schedule, which consists of 24 hours on duty followed by 72 hours off. Although this model is becoming more common, limited empirical evidence exists regarding its impact, particularly from the organizational perspective of fire service administrators.

Methods: A cross-sectional, mixed-methods survey was distributed to 39 fire department administrators in the United States who had implemented or were considering the 24/72 schedule. Fifteen administrators representing departments across seven states completed the survey. Quantitative data were analyzed using descriptive statistics, and qualitative responses were examined using thematic analysis.

Results: Administrators reported high levels of satisfaction with the 24/72 schedule, with 100% indicating they were satisfied or very satisfied. Reported benefits included improved morale, recruitment, retention, shift coverage, and reductions in sick leave. Qualitative findings reinforced these outcomes, with themes related to organizational stability and workforce well-being. The most frequently reported challenge was increased overtime costs, which some agencies noted required proactive planning.

Discussion: Findings suggest that the 24/72 schedule may offer meaningful workforce and organizational benefits for fire departments, particularly in areas related to morale, staffing stability, recruitment, retention, and recovery. However, financial sustainability, especially overtime costs, should be carefully considered during implementation. Broader, longitudinal research is needed to evaluate the long-term effects of the 24/72 schedule on firefighter health, safety, performance, and organizational outcomes.

KEYWORDS

24/72, D shift, firefighter sleep, firefighters, mental health, physical health, shift schedule

Introduction

Firefighters and other emergency responders routinely work long, high-demand shifts in environments defined by unpredictability and risk. Researchers have increasingly shown that extended shifts, although common, can impose physical and psychological health consequences (1). Over the past century, firefighter schedules have shifted from 84 h work weeks in the early 20th century to the now standard average of 56 h per week. Growing evidence of fatigue, safety concerns, and negative health impacts has accelerated interest in alternative scheduling models to reduce the firefighter workweek. Agencies have begun adopting alternative models, including the 24/72 or “D shift” schedule, which grants 24 h on duty at the fire station followed by 72 h off duty. This model may allow for more adequate recovery, potentially reducing the cumulative burden of fatigue while also improving workforce retention, morale, and long-term wellness.

Physical health

Firefighters engage in physically demanding tasks, making health maintenance essential not only for personal well-being but also for operational effectiveness. Physical fitness provides resilience against firefighting’s physiological demands, including heavy exertion, repeated trauma exposure, and unpredictable call volumes (2). Research consistently demonstrates that shift schedules significantly shape physical health outcomes (3, 4). For example, firefighters working on a 48/96 schedule exhibited lower body fat percentages and greater trunk flexibility compared to those on a 24/48 schedule, suggesting that longer recovery windows may enhance physical performance and health (3). Beyond body composition, extended and irregular shifts can contribute to a host of adverse health outcomes such as poor sleep quality and quantity. Sleep disruption and circadian misalignment, common in fire service schedules, can interfere with glucose metabolism, immune function, and endocrine regulation, increasing the risk of obesity, diabetes, and metabolic syndrome (5, 6). Irregular sleep and prolonged workweeks elevate stress hormone levels, which promote weight gain and hinder recovery from acute physical exertion (7).

Musculoskeletal injuries, which remain among the most common health problems in firefighters, are strongly associated with inadequate rest and prolonged physiological strain. Research highlights that poor sleep quality reduces heart rate variability, a key marker of recovery, and increases susceptibility to musculoskeletal injuries by impairing the body’s adaptive capacity following high-stress physical activity (8). Given the repetitive lifting, carrying, and high-load tasks performed on shift, insufficient recovery between shifts may amplify injury risks. Cardiovascular disease (CVD) remains the leading cause of line-of-duty deaths among firefighters. Long shifts and overtime elevate heart rate, blood pressure, and stress biomarkers, intensifying hypertension and long-term CVD risk (9, 10). Sudden cardiac death alone accounts for nearly half of firefighter line-of-duty fatalities, and sleep disorders have been shown to significantly heighten this risk (11).

Cancer risk also intersects with scheduling-related sleep disruption. The International Agency for Research on Cancer

classified night shift work as a probable carcinogen due to its disruption of circadian rhythms, which impairs DNA repair and cell cycle regulation (13). Firefighters’ occupational exposures to carcinogens, compounded by disrupted biological rhythms, increases their long-term susceptibility to cancers, including digestive, prostate, and hematologic cancers (14). Taken together, these findings underscore that firefighter shift schedules cannot be understood as operational decisions alone; they are direct determinants of physical health outcomes. By reducing the frequency of sleep-disruptive nights and allowing greater time off between shifts, fire departments may be able to mitigate risks while sustaining operational readiness and sustained workforce health.

Cognitive function and fatigue

Long shifts can substantially impair cognitive function and elevate error risk. Persistent sleep deficits among 24 h shift workers may contribute to long-term cognitive decline and diminished performance. Firefighters working 24 h shifts showed cognitive performance deficits comparable to moderate alcohol impairment (15). Similarly, night and rotating shift work degraded decision-making capacity, situational awareness, and reaction times (16). Even modest disruptions in sleep can significantly reduce cognitive functioning (17). Firefighters with higher wakefulness after sleep onset (WASO) scores during their shifts demonstrated measurable declines in psychomotor vigilance reaction time and processing speed between the beginning and end of a 24 h shift. These decrements affected processing speed, visual-motor coordination, and sustained attention—core abilities for safe and effective job performance. Importantly, these impairments occurred even when overall sleep duration was close to 6 h, underscoring the fact that fragmented and inefficient sleep is as damaging as short sleep duration (17). Together, these findings demonstrate that as fatigue accumulates, so does the risk of accidents, poor decision-making, and long-term health deterioration which poses serious risks for both firefighters and the citizens they serve.

Mental health

The psychological toll of extended firefighter shifts remains substantial. Long duty hours and limited recovery opportunities correlate with higher rates of anxiety, depression, and burnout among emergency responders, conditions that can impair cognitive resilience and long-term well-being (5, 6). Scheduling patterns strongly influence work-life balance and job satisfaction. For example, firefighters on schedules such as 48/96 often report improved family time and morale (3). However, when recovery is inadequate, even longer schedules may contribute to cumulative fatigue and emotional exhaustion, diminishing long-term career satisfaction (5, 6).

Similar to physical health, sleep quality and duration are critical mediators of mental health. Persistent sleep disruption impairs trauma processing during REM cycles, preventing integration of traumatic memories and increasing susceptibility to post-traumatic stress disorder (18). Firefighters with chronic

sleep difficulties exhibited heightened hyperarousal and intrusive re-experiencing, core features of PTSD (19). Professional firefighters with poor sleep quality demonstrated higher rates of depression, substance use, and lower overall quality of life, underscoring the role of sleep disruption as both a predictor and a consequence of poor psychological health (20). The link between sleep problems and suicide risk is particularly concerning (21). Sleep disturbances significantly increased suicide risk among firefighters, especially in those with lower levels of mindfulness (21). Depression, which is already more prevalent in firefighters than in the general population, may be intensified by chronic fatigue and sleep deprivation, leading to greater emotional exhaustion and social withdrawal (20, 22).

Extended workweeks also heighten vulnerability to burnout. Disrupted sleep left firefighters less resilient to occupational stress and more prone to emotional exhaustion (23). Poor sleep directly undermined problem-solving ability and decision-making flexibility, reducing firefighters' capacity to adapt to complex, unpredictable environments (12). Over time, these factors increase risk for burnout, defined by chronic emotional exhaustion, depersonalization, and diminished sense of accomplishment. The negative impacts extend beyond the individual firefighter to family systems. Long hours and irregular schedules often result in missed life events, strained relationships, and emotional distance. Research has shown that these factors contribute to marital conflict and even divorce in first responder families (24). Research demonstrates that children and spouses of emergency responders face elevated risks of anxiety, depression, and reduced well-being, particularly when firefighters work extended schedules that limit family contact (25).

Overall, these findings indicate that firefighter mental health cannot be addressed in isolation from scheduling practices. Structural interventions that reduce chronic sleep debt, such as implementing reduced workweek schedules, sanctioning on-shift rest, and providing evidence-based sleep hygiene interventions, are vital for protecting mental well-being.

While much of the existing literature focuses on the physiological and psychological effects of long shifts, fewer studies have examined how administrative and organizational factors shape shift work practices. Implementing new shift schedules involves complex administrative processes, including labor negotiations, policy revisions, staffing allocation, and budgetary adjustments. These organizational dimensions can significantly influence whether a schedule change succeeds or fails. Understanding shift work as both a health issue and a management system challenge is therefore essential to designing policies that are effective, sustainable, and aligned with departmental goals.

Purpose

As transitioning to the 24/72 shift schedule, or D-shift model, is becoming more popular among fire departments, limited empirical evidence exists regarding its impacts. In particular, there is a lack of research examining the perspectives of fire service administrators, and no published information was identified that addresses the operational, logistical, or

organizational considerations associated with implementing this schedule. The purpose of this study was to examine fire department administrators' experiences with and perceptions of the D shift schedule. The study aims to document the impact of implementing this schedule on workforce outcomes such as morale, recruitment, retention, staffing coverage, and overtime costs, while also capturing insights into perceived challenges and benefits. By combining quantitative measures with qualitative reflections, the study seeks to generate a more comprehensive understanding of how the 24/72 model affects organizational functioning and workforce well-being. The goal is to inform policy discussions and provide evidence that may guide fire service leadership in making scheduling decisions that promote both firefighter health and organizational sustainability.

This work is important to both public safety and public health. Firefighters represent a frontline workforce whose health and readiness directly affect the safety of the communities they serve. Scheduling practices that contribute to fatigue, poor physical health, or diminished morale may impair performance and increase the risk of operational errors during emergencies. Conversely, schedules that provide adequate recovery and promote wellness have the potential to reduce occupational injuries, improve mental and physical health, enhance retention, and strengthen overall workforce resilience. Evidence regarding these impacts is therefore essential for informing leadership and policymaking in the fire service.

Research questions

This study addressed the following questions:

1. How do fire service administrators perceive the impacts of the 24/72 shift schedule on morale, recruitment, retention, staffing coverage, and sick leave?
2. What operational and financial challenges (e.g., overtime costs, administrative logistics) are associated with implementing a 24/72 schedule?
3. What advantages and disadvantages do administrators identify when reflecting on their departments' experiences with the 24/72 model?
4. To what extent do administrators recommend the 24/72 schedule to other fire departments, and what reasons do they provide for their recommendations or hesitations?

Materials and methods

Study design

Researchers employed a cross-sectional, mixed-methods survey design to assess fire department administrators' perceptions of and experiences with implementing a 24/72 shift schedule located primarily in the Southeast and Mid-Atlantic/Northeast regions of the U.S., with some agencies in the Midwest and Southwest (Illinois, Florida, Maryland, Missouri, North Carolina, New Jersey, Oregon, and Texas). The design allowed for quantitative analysis of structured survey items and qualitative exploration of open-ended responses. The study

population included fire service administrators employed in U.S. fire departments that had either adopted or were considering adopting a 24/72 shift schedule. The survey was sent out in late 2025 to $n = 39$ fire service administrators. Eligibility criteria required participants to hold supervisory or administrative roles (e.g., Fire Chief, Deputy Chief, Division Chief) and to possess knowledge regarding departmental scheduling decisions and outcomes. A total of $n = 15$ agencies representing 15 distinct fire departments across seven U.S. states completed the survey. Potential agencies were identified through professional fire service networks and referrals from other administrators. Participating agencies represented a range of department sizes and geographic regions across seven states. Respondents held senior leadership roles, including Fire Chiefs, Deputy Chiefs, and Division Chiefs, and were directly involved in or knowledgeable about scheduling decisions and implementation processes. Agencies varied in their stage of adoption, with some having not yet implemented the 24/72 schedule, while others reported multiple years of experience under the model. This variation provided perspectives across different phases of implementation and operational maturity.

Eligible administrators received email invitations containing an information sheet that outlined the study purpose, procedures, and confidentiality safeguards. Participation was voluntary, and electronic informed consent was obtained prior to survey initiation. The survey was distributed electronically through Qualtrics survey software. Respondents completed the survey independently, requiring an estimated 15–20 min. The instrument was developed by subject matter experts in firefighter health along with firefighters and pilot tested with two administrators to ensure clarity and content validity prior to dissemination. The final survey consisted of 32 items divided into three domains: 1) department characteristics (e.g., size, geographic region, implementation timeline), 2) perceptions of the 24/72 schedule, and 3) open-ended reflections capturing experiences, challenges, and lessons learned during implementation. Question formats included multiple-choice items, Likert-type scales, and open-text responses.

Quantitative data were analyzed using SAS version 9.4. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated for survey responses. Inferential analyses were not performed due to the small sample size and nature of the questions. Qualitative data from open-ended responses were analyzed in ATLAS.ti. A thematic analysis approach, guided by Braun and Clarke's (2006) six-phase framework, was used to identify recurring themes and patterns. Two independent coders reviewed the responses, and consensus was reached through comparison and discussion to enhance analytic reliability. In addition to identifying overarching themes, a structured coding process was used to organize the data. Initial open coding generated a set of descriptive codes reflecting administrative, operational, and workforce-related concepts (e.g., staffing logistics, overtime costs, morale, recruitment, fatigue reduction). These codes were iteratively refined and grouped into higher-order themes and subthemes. While a full codebook is not presented, representative codes are reflected within the thematic structure and supported by illustrative quotations. The study protocol received approval from the university's Institutional Review Board.

Results

Quantitative results

A total of $n = 15$ agencies completed the survey. Of these, four agencies had not yet implemented the D shift schedule, 5 had been using the schedule for fewer than five years, and 6 had used it for more than five years. When asked the primary reasons for adopting or planning to adopt the 24/72 schedule, the most frequently cited response was retention ($n = 12$), followed by fatigue reduction ($n = 11$), recruitment ($n = 10$), and health and safety of members ($n = 10$). Other reasons included reduced overtime costs ($n = 5$), personnel requests ($n = 5$), and sick leave reduction ($n = 3$). Overall satisfaction with the schedule was high: 82% of respondents reported being very satisfied, and the remaining 18% reported being satisfied. Most agencies (75%) indicated that overall morale had much improved, while 16.7% reported morale had somewhat improved, and 8.3% saw no change. A large majority (86.7%) would recommend the D shift schedule to other agencies, with 13.3% unsure. The most common reasons given were improved morale and adequate rest periods between shifts ($n = 5$), followed by recruitment and retention benefits ($n = 3$ each). One administrator noted: "I recommend the 24/72 shift schedule because it offers significant benefits for firefighter wellness, operational efficiency, and overall morale. With 72 h off between shifts, personnel have more time to recover physically and mentally, which helps reduce fatigue, burnout, and sleep-related health issues... Additionally, the schedule is attractive for recruitment and helps retain experienced personnel by offering a predictable and sustainable work rhythm".

Regarding operational impacts, one-third of agencies reported that shift coverage had greatly improved, 44.4% noted it had somewhat improved, and 22.2% reported no change. Staffing levels were rated as greatly improved (30%), somewhat improved (30%), unchanged (30%), or somewhat worse (10%). Most agencies (71.4%) reported no change in the need for backfilling or temporary staff; however, eight agencies cited increased overtime needs as a staffing challenge. Two-thirds of agencies (66.7%) reported changes in overtime costs after implementation, with 83.3% of these indicating an increase. Specifically, 22.2% reported a significant increase, 44.4% a slight increase, 11.1% a slight decrease, and 22.2% no change. In contrast, 62.5% of respondents noted a decrease in sick leave following the schedule change, and 45.5% reported adjustments or reductions in sick leave or vacation accrual.

Recruitment and retention outcomes were generally positive. Recruitment improved in 64.3% of agencies, declined in 7.1%, and remained unchanged in 28.6%. Retention improved in 50%, declined in 7.1%, and remained unchanged in 14.3%. Finally, 57.1% of agencies reported plans to measure or track the impact of the 24/72 schedule on workforce outcomes, including work-life balance as well as physical and mental health indicators.

Qualitative results

Open-ended survey questions invited agencies to reflect on a range of issues, including methods for measuring work-life

balance, physical and mental health indicators, staffing challenges, administrative costs, and perceived advantages and disadvantages of the 24/72 schedule. Agencies were also asked to provide recommendations for improving implementation. It is important to reiterate that these perspectives come from fire station administrators and firefighters at the same agencies may not have the same sentiment. A thematic analysis identified two overarching themes, each with associated subthemes. [Table 1](#) provides the organizational theme results, [Table 2](#) provides the well-being theme results.

Theme 1: organizational

Subtheme 1: administrative issues

Administrative considerations were consistently raised across responses. Agencies described challenges related to staffing adequacy, scheduling training, and managing overtime during the implementation phase. Respondents also noted initial one-time expenses associated with transitioning to a 24/72 schedule, such as additional gear lockers, beds, refrigerators, pantries, and personal protective equipment (PPE). While these costs were acknowledged, most agencies emphasized that they were anticipated and budgeted for in advance and therefore did not create significant barriers. A frequently expressed perspective was the importance of “planning ahead” to minimize administrative disruptions during the transition to a new schedule.

Subtheme 2: retention and recruitment

Recruitment and retention emerged as key organizational advantages of the D shift schedule. Agencies commonly reported that the extended off-duty periods improved work-life balance, which contributed to higher retention rates and enhanced overall morale. Several administrators stated that the 24/72 schedule had increased their competitiveness in recruitment, particularly when neighboring agencies had already adopted the model. One respondent described that being among the few departments in their region without a 24/72 schedule had negatively affected recruitment until the schedule was adopted.

Theme 2: well-being

Subtheme 1: health

Respondents frequently emphasized firefighter health and well-being as a central reason for adopting the D shift schedule. Agencies consistently reported that the extended rest periods afforded by the schedule helped reduce fatigue, burnout, and sleep-related health problems. Several agencies noted observable declines in sick leave usage following implementation. In addition, multiple agencies indicated that they were actively tracking physical and mental health indicators to better evaluate long-term impacts. These efforts were viewed as an important step toward generating more robust evidence on the direct health benefits of the 24/72 schedule.

Subtheme 2: morale

Morale emerged as a dominant subtheme across the qualitative responses. Administrators described improvements in work-life balance as a key driver of enhanced morale among personnel. When asked whether they would recommend the 24/72 schedule, 4 agencies specifically cited improved morale, and 2 highlighted gains in work-life balance. In responses to the question about advantages of the 24/72 schedule, morale was mentioned five times, underscoring its salience across agencies. Several respondents further noted that this improvement in morale had a secondary benefit of supporting staff retention, reinforcing the schedule’s role in promoting both individual well-being and organizational stability.

Discussion

The findings from this survey provide valuable insights into the organizational and workforce impacts of adopting a 24/72 shift schedule in the fire service. As noted in the introduction, the traditional firefighter workweek has been criticized for contributing to fatigue, disrupted sleep, and negative health outcomes, while alternative models such have been promoted as strategies to enhance recovery, morale, and retention. The present study contributes to this emerging area of research by focusing specifically on the perspectives of fire service administrators, a group that plays a critical role in evaluating and implementing scheduling reforms but whose experiences have not been systematically documented in the literature.

Among the 15 agencies surveyed, most had already transitioned to the 24/72 schedule, with over half reporting more than five years of experience under this model. Overall satisfaction was strikingly high, with 100% of respondents indicating that they were either satisfied or very satisfied with the schedule. This finding is particularly noteworthy given that participants were primarily administrators, who often must balance workforce needs with financial and operational constraints. Similarly, more than 90% of respondents perceived improvements in agency morale, and nearly 87% stated they would recommend the D shift schedule to other departments. These results align with prior studies suggesting that longer recovery periods are associated with improved job satisfaction and workforce stability (2, 3).

Positive operational outcomes also emerged. More than three quarters of agencies reported improvements in shift coverage, and 60% indicated staffing levels had improved. Recruitment and retention outcomes were favorable, with 64.3% of agencies observing gains in recruitment and 50% noting improved retention. Given ongoing national concerns about firefighter recruitment and workforce sustainability, these findings suggest that the 24/72 schedule may serve as a competitive advantage in attracting and retaining personnel.

At the same time, the results highlight potential challenges. Two-thirds of agencies reported changes in overtime costs following implementation, with the majority of those describing increases. While this may reflect transitional issues as departments adjusted staffing and scheduling systems, the financial sustainability of the 24/72 model warrants careful consideration. Importantly, however, most agencies (71.4%)

TABLE 1 Provides participant quotes organized by Theme 1, questions and subthemes.

Theme 1: Organizational		
Subtheme	Corresponding Question	Quotes
Administrative	Would you recommend the 24/72 schedule to other agencies? Why or why not?	There are positives and negatives to the 24/72. The 24/72 also depends on adequate staffing, whether it be more F/T employees or having a robust P/T program, which is difficult in our area. However, overall I believe the 24/72 has been a benefit to firefighter wellness.
		Only issue is the increase in cost to the District.
		With more rested crews and less unscheduled leave, we've experienced greater stability in daily staffing levels, reducing the need for last-minute backfilling and overtime costs.
	Have there been any changes in overall administrative costs (lockers, refrigerators, PPE, staffing software, etc.) due to the new schedule/proposed new schedule? If so, please explain.	As part of the transition, we did need to outfit a few stations with additional lockers. However, this need was minimal. Previously, due to a staffing factor of 1.2, each apparatus was assigned four personnel, which meant many stations were already equipped with extra lockers. Under the 24/72 staffing model, our staffing factor was reduced to 1.0, bringing the standard staffing to three personnel per apparatus—except for our truck companies, which maintained a staffing level of four. As a result, only a small number of additional lockers were required. Beyond this, there were no significant administrative costs associated with the change. We continued using our existing staffing software, and for the two new personnel hired, we were able to utilize PPE already in inventory, avoiding additional equipment expenditures.
		Yes, there have been some increases in overall administrative costs resulting from the implementation of the D Shift schedule. These were primarily one-time infrastructure and equipment investments necessary to accommodate the additional shift.
		These administrative costs were anticipated and primarily one-time in nature. They are considered a reasonable investment to support the long-term operational and personnel benefits of the D Shift model.
		We have added 7–24 h units, the cost increased with each additional unit added. No change in cost to stations that already exist.
	What challenges have you or your agency experienced with the 24/72 schedule? Or, if you are planning to move to this schedule, what were the biggest challenges in moving to this approach?	Several challenges had to be addressed prior to implementing the 24/72 shift schedule. One of the primary hurdles was the redistribution of all personnel across four shifts, which required careful planning to ensure operational readiness. Additionally, timely promotional processes were necessary for the ranks of District Chief, Lieutenant, and Driver Operator to ensure key positions were filled before the implementation date. The department also had to revise the multi-year training plan and adjust the annual training calendar to align with the new four-shift rotation.
		Convincing decision makers to fund it.
		No major changes in administrative costs have been seen.
		There have been several changes impacting overall staffing costs. First, with the reduction in total hours worked, employee hourly wages were adjusted to ensure their annual income remained consistent. This resulted in an approximate 20% increase in the hourly wage. Consequently, the overtime rate of pay also increased, creating higher costs when overtime is worked. To mitigate this, the department implemented a pay structure where the first 10 h of overtime in each pay cycle are compensated at straight time rather than at the premium rate. Any overtime beyond those 10 h is paid at the higher, premium rate. Additionally, transitioning to a four-shift rotation necessitated the addition of a fourth day of training. This resulted in an increased cost for compensating Field Training Officers (FTOs) and training staff for the additional training day.
	What suggestions do you have for improving the 24/72 shift schedule or its implementation?	Budget for additional positions if able. There is always something that comes up such as Workers Comp, off-duty injury, military deployment, etc. In our situation, one or two of these situations causes an increase in OT, but if a department can employ additional staff to overcome these obstacles it would be good.
		Labor and management both have to be willing to give in order to make the math work.
		For agencies currently operating under a 24/48 or similar schedule, I would strongly recommend allowing ample time for key preparatory steps. Specifically, consider the availability of promotable personnel and the time required to complete promotional processes and any necessary training for those stepping into new roles. Additionally, review and revise your training plans well in advance to ensure they align with the new shift structure. Lastly, evaluate your vacation scheduling process early, as adjustments to annual picks and leave management will likely be needed to support a smooth transition.

(Continued)

TABLE 1 Continued

Theme 1: Organizational		
Subtheme	Corresponding Question	Quotes
	Is there anything else you would like for us to know about this issue?	Good schedule for firefighters as long as the organization can be staffed appropriately. And ensure that everyone still obtains all necessary training as some can be missed during time off.
Retention/ Recruitment	If yes, how are you/will you measure work-life balance and what changes (if any) are you noticing?	We hope to see a reduction in PTSD cases, substance abuse, divorces, and overall sick leave. We hope to see an increase in the recruitment and retention of our firefighters.
	Would you recommend the 24/72 schedule to other agencies? Why or why not?	Working for retention and recruitment, and moral.
		The extended time off also improves work-life balance, allowing firefighters to spend more time with family, pursue personal interests, or attend to secondary responsibilities. Additionally, the schedule is attractive for recruitment and helps retain experienced personnel by offering a predictable and sustainable work rhythm. Overall, the 24/72 model supports both firefighter well-being and departmental effectiveness.
		We were one of the few in NJ not to work this schedule. It affected recruiting.
		Personnel feedback has been overwhelmingly positive. The improved work-life balance has contributed to higher morale, which in turn supports employee retention and engagement—critical in today’s competitive hiring environment.
	What advantages have you noticed with the 24/72 schedule? Or, if you are planning to move to this schedule, what advantages do you anticipate?	Better work-life balance for our firefighters resulting in increase in morale. Will greatly assist with recruitment and retention. Will hopefully show a reduction in sick leave use.
		The improved work-life balance afforded by the 24/72 schedule has contributed to these positive trends in staffing behavior.
		Just letting the public know we plan to transition to the 24/72 has increased moral and caused a record number of candidates to sign up for the next written entrance exam.

reported no substantial increase in the need for backfilling or temporary staff, and many noted decreases in sick leave use, suggesting that the schedule may offset some of the increased overtime expenditures by reducing absenteeism and related costs. Taken together, these findings indicate that the 24/72 schedule is perceived by fire service administrators responding to this survey as beneficial for workforce morale, recruitment, retention, and well-being, though financial impacts remain a concern. The results reinforce arguments advanced in the broader literature that scheduling models influence not only firefighter health and safety but also organizational outcomes and long-term sustainability (8, 10).

While the findings suggest strong perceived benefits of the 24/72 schedule, they should be interpreted within the context of the study design. The reliance on administrator perspectives provides important insight into organizational priorities, including recruitment, retention, and operational stability, but offers only partial visibility into the full impact of scheduling changes within a 24/7 operational environment. Firefighter-level experiences, including fatigue, sleep quality, and health outcomes, may differ from administrative perceptions and require further investigation.

The results highlight a critical tension between organizational benefits and resource constraints. Improvements in morale, recruitment, and retention suggest that the 24/72 model may enhance workforce sustainability. However, the reported increases in overtime costs indicate that these benefits may come with financial trade-offs that require strategic planning and resource allocation. Importantly, these findings reinforce that shift schedules should be conceptualized not only as operational

decisions but also as structural determinants of workforce health and performance. The alignment between perceived improvements in well-being and organizational outcomes suggests that schedule design may serve as a lever for both individual and system-level change. However, without objective measures of health, performance, and safety outcomes, conclusions regarding long-term impact remain limited. Future research should incorporate multi-level data, including firefighter-reported outcomes, physiological indicators, and operational performance metrics, to more fully evaluate the effects of the 24/72 schedule. Longitudinal designs will be particularly important for understanding sustainability and long-term outcomes.

Limitations

This study is subject to several limitations. The sample size was relatively small ($n = 15$) and findings were based on self-reported perceptions, which may introduce bias. Additionally, data were collected exclusively from individuals in managerial or administrative roles. While these perspectives are critical for understanding organizational decision-making, they may not fully reflect the experiences of frontline firefighters or line personnel. The study also relied on a single data source (administrator survey responses) and did not incorporate triangulation with additional data sources such as objective workforce metrics, physiological measures, or firefighter-level perspectives. This limits the ability to validate findings across methods and may reduce the depth of interpretation. Identifying

TABLE 2 Provides participant quotes organized by Theme 2, questions and subthemes.

Theme 2: Well-Being		
Subtheme	Corresponding Question	Quotes
Health	If yes, how are you/will you measure work-life balance and what changes (if any) are you noticing?	Sleep cycle, recovery, overall feeling of wellness, sick leave usage.
		We hope to see a reduction in PTSD cases, substance abuse, divorces, and overall sick leave.
		Since implementing the D Shift, we've observed a reduction in both sick leave and injury/LTD usage, suggesting improved rest, recovery, and overall work-life balance for our personnel. This change has contributed to better coverage, reduced burnout, and enhanced morale. We'll continue to monitor these trends to ensure the long-term success of the shift structure and its impact on wellness.
	If yes, what physical health indicators did you/will you track, how are you tracking them, and what changes (if any) are you noticing?	We have seen a decrease of Workers Comp claims in the years since switching to the 24/72 schedule. (Our health indicators are tracked as part of annual NFPA 1582 physicals for staff members.)
	Would you recommend the 24/72 schedule to other agencies? Why or why not?	I recommend the 24/72 shift schedule because it offers significant benefits for firefighter wellness, operational efficiency, and overall morale. With 72 h off between shifts, personnel have more time to recover physically and mentally, which helps reduce fatigue, burnout, and sleep-related health issues. The extended time off also improves work-life balance, allowing firefighters to spend more time with family, pursue personal interests, or attend to secondary responsibilities. Additionally, the schedule is attractive for recruitment and helps retain experienced personnel by offering a predictable and sustainable work rhythm. Overall, the 24/72 model supports both firefighter well-being and departmental effectiveness.
		Better sleep recovery time.
		The D Shift allows for more recovery time between shifts, helping reduce fatigue and stress. Since its implementation, we've seen a noticeable drop in sick leave and injury/long-term disability usage, which suggests healthier and more resilient personnel.
	What advantages have you noticed with the 24/72 schedule? Or, if you are planning to move to this schedule, what advantages do you anticipate?	More time off, staff is rested when they return to work.
		Better health and time to rest even with OT.
Morale	If yes, how are you/will you measure work-life balance and what changes (if any) are you noticing?	One of the most notable advantages we've seen with the 24/72 schedule is a reduction in both sick leave and injury leave usage. 1. Improved Rest and Recovery The extended 72 h off-duty period provides personnel with more time to rest, recover, and attend to personal obligations, which appears to contribute to improved overall health and well-being. This increased recovery time has helped decrease fatigue-related absences and stress-related injuries. 2. Decrease in Unscheduled Leave Since adopting the 24/72 schedule, we've seen a decline in unscheduled sick days, which has helped stabilize daily staffing levels and reduce the need for backfilling with overtime. 3. Positive Impact on Injury Leave The added rest has also contributed to a lower incidence of work-related injuries, as personnel are returning to work more refreshed and physically prepared. This has a direct impact on reducing long-term disability and workers' compensation exposure.
		Is there anything else you would like for us to know about this issue?
		It's the best shift for my staff for safety and health reasons.
Morale	If yes, how are you/will you measure work-life balance and what changes (if any) are you noticing?	This change has contributed to better coverage, reduced burnout, and enhanced morale.
		Would you recommend the 24/72 schedule to other agencies? Why or why not?
		We have not officially gone to the schedule yet, but knowing it is coming has had a positive impact on morale and I know they will be very happy with the schedule. We are hoping to sign an agreement with the fire association to begin the transition in January of 2026. We feel it will be very positive for morale and we believe City leadership will be pleased that we went to the 24/72.

(Continued)

TABLE 2 Continued

Theme 2: Well-Being		
Subtheme	Corresponding Question	Quotes
		The improved work-life balance has contributed to higher morale, which in turn supports employee retention and engagement—critical in today’s competitive hiring environment.
	What advantages have you noticed with the 24/72 schedule? Or, if you are planning to move to this schedule, what advantages do you anticipate?	Morale, recruitment, work quality
		Better work-life balance for our firefighters resulting in increase in morale.
		Better morale.

departments using or transitioning to the schedule was challenging, and the relative newness of the 24/72 model limits broader generalizability. Future research should incorporate multiple data sources, including longitudinal health outcomes and firefighter-level data, to strengthen validity and provide a more comprehensive understanding of scheduling impacts.

Conclusions

The findings of this study indicate that the D shift schedule is viewed favorably by respondents in fire departments across multiple states. Administrators reported high levels of satisfaction with the schedule and highlighted improvements in employee morale, workforce recruitment, and retention, along with reductions in sick leave. These results suggest that the 24/72 model may offer organizational and workforce benefits, particularly in enhancing firefighter well-being and supporting workforce stability.

At the same time, increased overtime costs were identified as a significant drawback, underscoring the importance of careful planning and resource allocation during implementation. While many agencies noted that initial costs and logistical adjustments were anticipated and managed effectively, the long-term financial implications of the 24/72 schedule remain an area of concern for some departments.

Further research is warranted to examine the broader health impacts of the 24/72 schedule, including objective measures of physical and mental health, sleep quality, and long-term career outcomes. Expanding the evidence base will be essential to guiding policy discussions and supporting data-driven decision-making on firefighter scheduling models.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author/s.

Ethics statement

The studies involving humans were approved by Institutional Review Board of University of Central Florida (STUDY00008019).

The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

KO: Writing – original draft, Writing – review & editing. LA: Writing – original draft, Writing – review & editing. BC-M: Writing – original draft, Writing – review & editing. LP: Writing – original draft, Writing – review & editing. MB: Writing – original draft, Writing – review & editing. JD: Writing – original draft, Writing – review & editing. RW: Writing – original draft, Writing – review & editing. KT: Writing – original draft. RT: Writing – original draft.

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